



Water Efficiency and Public Information for Action
مشروع الكفاءة المائية والتوعية



**Monitoring and Evaluation
of Community Grants Programs**

Final Report

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Mona Grieser
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EVALUATION OF AN AED/WEPIA GRANT PROGRAM MADE TO POOR COMMUNITIES IN THE HASHEMITE KINGDOM OF JORDAN TO IMPROVE THEIR FINANCIAL SITUATION WHILE REDUCING THEIR WATER CONSUMPTION

EXECUTIVE SUMMARY

The Hashemite Kingdom of Jordan faces a chronic imbalance in the population–water resources equation. In 1990 the population was nearly four million and the nationwide demand on water was approximately 1,000 million cubic meters. In 2001 the population was estimated at nearly five million with water demand exceeding 1,250 million cubic meters; representing an increase of nearly 25% in both population and demand for water. The available water supply, however, only increased by about 12% (from 850 million cubic meters to 950 million cubic meters) in the same period. The increase in water supply came through greater use of groundwater aquifers, sometimes to levels beyond the safe yield, wastewater reuse, and additional rights to water from the Jordan River System, which the country gained after signing a peace treaty with Israel in 1994. However, the water deficit is expected to continue rising and will likely reach 400 million cubic meters in the year 2020. The inadequate supplies of water and other natural resources have partly been contributing factors to causing debt, poverty, and unemployment to become fundamental problems in Jordan. Nearly 2% of the population earns less than \$1 per day, and another 7.4 % earns less than \$2 per day, thus, placing approximately 30% of the population in below-the-poverty line living conditions. Since the early 1990s, poverty has risen continuously amongst Jordan's population. With nearly one third of the entire population living below the poverty threshold, access to municipal and other vitally important services is unevenly distributed across the regions, and rural areas in the south and northeast of the country are under-served. These shortfalls in service delivery have reduced income opportunities, and low income in turn has decreased people's ability to pay for services.

In an effort to combat poverty in the Kingdom, the Government of Jordan (GoJ) launched several programs through the Ministry of Planning (MoP). Of those, the Enhanced Productivity Program (EPP) is the most comprehensive program addressing a variety of sectors. The EPP is a government-funded development project based on the premise that the government has a role to play in facilitating the ability of all Jordanians to improve their lives. To that end, the EPP creates opportunities for rural communities to be a part of income-producing and self-sustaining industries. In addition, and unlike previous government initiatives, the EPP focuses on an integrated approach to rural development where one EPP project leads directly to and supports other EPP projects. The end result is individuals and communities generating income and employment in their towns and villages, with the government playing the role of the enabler and supporter.

The EPP has five interrelated components all of which are intended to increase the productivity of individuals and their communities and promote rural development. These components are The Rural Community Cluster Development Program, The Enhanced Productivity Centers Program, The Community Infrastructure Program (CIP), Training, and Small Grants. The (CIP) component of the EPP aims at enhancing productivity and rural development through infrastructure projects that

support enterprise development in tourism, agribusiness, municipal, and governorates' development. The CIP provides finance for projects in the agribusiness and tourism sectors, and in support of municipal and governorates development, or village cluster projects that may lack funding. It also offers grants to municipalities, local councils and NGOs to support income-generating projects in least developed communities. The CIP is implemented along two parallel tracks; fast track for already identified projects, and pilot track for long-term economic projects that increase employment and income. The main objectives of the CIP are to:

- Enhance individual, community and regional productivity through infrastructure development
- Develop infrastructure in support of individual, village and regional enterprise development and income generating projects.
- Encourage large-scale infrastructure projects in tourism and agriculture
- Tackle the most pressing infrastructure development priorities of the municipalities and governorates
- Create employment opportunities
- Support infrastructure development for village clusters
- Create an environment in the governorates that is favorable to private sector investment

One of the main components under the CIP is Agribusiness. With Jordan's rural economy employing a sizeable segment of the labor force, there are yet challenges in the local practices in the way water is used, the crops that are grown, and the markets chosen that reduce the impact of agriculture on Jordan's people. The EPP/CIP agribusiness component seeks to enhance the infrastructure supporting agriculture, improve the living standards of farmers and increase their participation in investment and development. The EPP/CIP's approach to agribusiness is truly multi-faceted. This component employs Fast Track and Pilot Programs to create both immediate and long-term impacts. The disciplines that agribusiness addresses include water use, marketing, extension services, conservation of medical and herbal plants, association building and alternative crop development to expand yield and to expand the choices available to Jordan's farmers.

This report presents the results of an evaluation conducted for small projects that were funded by the MoP's CIP program, which was implemented by the collaboration between the Academy of Educational Development and the Farmer's Association Jordan Valley District Branch (FAJVDB), and other projects implemented by the AED's WEPIA Community Grants Program. As part of the EPP/CIP efforts in agribusiness, the Academy for Education Development and the Farmers Association Jordan Valley District Branch applied for funding to implement a project under the name of ***"Water-related Small Infrastructure Development to Promote Productivity in Rural Areas"***. The main objectives of the proposed project were to increase the total income of farming and other families living in low-income areas of Jordan through structural improvements to existing water networks and construction of new structures. The project also aimed at reducing farmer investment costs that would result in increases in family disposable income. The geographic area included in both projects (i.e., the MoP and the WEPIA Community Grants Program) included

the eight poorest governorates in Jordan; Tafila, Madaba, Al Balqa, Maan, Mafrq, Karak, Ajloun and Irbid, in addition to Amman and Aqaba.

To achieve the objectives of the project, the members of the collaboration assumed different, yet complementary roles. Considering the vast experience of the AED in rural economic development and capacity building, it was one of the AED's objectives to build the capacity of the FAJVDB and better equip them to manage and implement such sizeable grants.

Following the refurbishment of the project headquarters in the Jordan Valley, the AED proceeded with all capacity building activities of the FAJVDB project team members. The AED trained FAJVDB employees on basic office and management skills as well as the technical skills of managing a grant program. The areas of training included computer training, computerized accounting training for financial staff, computerized inventory, warehouses and procurement systems, management of monitoring systems for grants. Experienced AED personnel conducted hands-on training according to international practices and procedures. In addition, some formal computer training was offered to some FAJVDB employees.

A committee was established to guide the FAJVDB identify potential grantees. Jointly, the collaboration established criteria for grantees selection, which included governorate poverty level, community size and circumstances, history of CBO, project eligibility and relation to water, project compliance with MOP goals, water availability in the community, number of potential beneficiaries, cost sharing, project total cost, and gender

To launch the project, members of the collaboration arranged a number of official visits to representatives of the eight Governorates. The key person met during those visits was the Governor. The collaboration's representatives gave the governors a description of the project, its objectives, beneficiaries, eligible grantees, and the minimum requirements for qualification. The collaboration representatives then expressed their interest to invite local CBOs to a meeting under the governors' patronage to introduce the project to them as a first step in soliciting applications. The governors in turn, and through the governorates development units, prepared lists of local CBOs and invited them to meetings held under their patronage and with the participation of representatives from the FAJVDB, the AED, and the Ministry of Planning, in addition to other governmental representatives.

A total of eight Governorate meetings were held in the target governorates and attended by CBOs invited by the governor.

Based on the received CBO level of interest, the collaboration hosted several training workshops to train the CBO representatives on how to identify project ideas, how to draft a technical proposal, how to justify the need for the project, and how to quantify the anticipated benefits of the project through the conduct of a preliminary feasibility analysis.

As the grant applications were received, an interdisciplinary committee of technical experts and representative of other funding institutions, according to the pre-set criteria, reviewed them. Following a first tier selection of applications, field visits were conducted to all the communities that submitted proposals. The purpose of those field visits was to ascertain and verify the information included in the proposals submitted by the CBOs. In total, 104 proposals were submitted, of which all were

visited. As a result of an evaluation, a total of 68 grants were awarded through the MoP program and 27 grants through the WEPIA Community grants program.

The final grantees were then supervised and assisted by the project team on how to proceed. The project team helped the grantees select a bidder and provided supervisory work on the implementation of the projects (e.g. construction supervision). In addition to the activities outlined above, the project team assisted the CBOs in preparing progress reports, monitoring and random visits, supervision of projects, project hand over, preparing project snag lists, overseeing project exit strategies, and final reporting.

The monitoring and evaluation (M&E) of implemented projects was deemed important to verify whether the implemented project met their objectives. Due to time constraints, the study team looked at all the awarded grants and selected a sample for inclusion into the M&E system. Although it was desired to select the sample on a completely random basis; it was deemed more appropriate to stratify the selection process. In total, 17 projects out of 68 the MoP grants (25%), and 12 out of WEPIA's 27 grants were selected.

Generally, the following data were collected

- Pre-Project incomes/expenditures of the monitored cases.
- Post-Project income/expenditures (or projected according to valid indicators)
- Social change occurring on the direct beneficiaries level of community level (mobility, marketing, attitude, decision making)
- Improvements in life quality (hygiene, saved time, saved effort) and quantifying such improvements

In addition to the data collected in the field surveys and interviews, the study team assessed the attitudes and opinions of the local community(ies) towards the grants, its implementation, management, benefits, shortcomings and recommendations. This was achieved through the conduct of mini-survey questionnaire that targeted the community.

The field assessments revealed that the great majority of the projects were economically sound and feasible. Although some had a stronger impact in terms of benefits, the great majority of the projects were also recoverable. The projects that were found infeasible, or had a very weak economic feasibility were not so due to the failure of the project. The reason was mostly the insufficiency of the grants, which often led to the scope of the project to be reduced (e.g., some of the water main projects in the south). This had an impact on the benefits and affected the projects feasibility. From a holistic perspective, the monitored projects were successful and had the following properties:

- ♦ Projects were mostly community based rather than individually based. Even some of the individual projects eventually reflected on a wider base through revolving grants.
- ♦ The projects decreased water related expenditures through increasing water availability, thus minimizing the need for acquiring or purchasing water by beneficiaries.

- ◆ The projects increased the incomes of beneficiaries through increasing the efficiency of water delivery, thus, improving farm yields. The increase of water availability also increased incomes through providing the beneficiaries with the ability to irrigate areas that were otherwise less irrigable.
- ◆ The projects with a wide beneficiary base promoted the principles of sharing water and importance of jointly preserving this valuable resource.
- ◆ The majority of the projects are economically sound and feasible and can be easily expanded to a wider base and duplicated in other areas of Jordan.

As mentioned before, structured interviews were held with beneficiaries, some of their family members, and CBO administrators. The purpose of such interviews was to gather information regarding the attitudes towards the community grants program and an attempt to capture benefits from the beneficiaries perspective. The results of those surveys revealed the following:

- ◆ All respondents were supportive of the principle of community grants, with nearly 50% supportive of the principle of revolving the grants.
- ◆ The average number of direct beneficiaries per grant is 54.
- ◆ The average number of indirect beneficiaries per grant is 350.
- ◆ The average proportion of water conservation per grant is 45%.
- ◆ The average increase in income per grant is 27%.
- ◆ The majority of the difficulties were faced during construction.
- ◆ All beneficiaries and CBOs indicated that the size of the grant was not adequate to complete the project in the desired scope according to their hopes and expectations.
- ◆ Nearly 25% of the respondents indicated that the training workshops needed to focus more on the conduct of feasibility studies for proposed projects.
- ◆ The following were identified as needed future projects
 - Reservoirs and wells construction 37% of respondents,
 - Channels and pipes lining 21% of respondents,
 - Retaining walls construction 10% of respondents,
 - Green house 26% of respondents,
 - Others 6% of respondents,

The economic soundness and feasibility of most of the projects assessed under this study is a clear indication that the program had significant positive socioeconomic impacts on the beneficiary communities.

Generally speaking, the program was very successful in meeting its preset objectives. In total, 68 grants were awarded to CBOs in the eight target governorates through the FAJVDB/AED program, and 27 grants were awarded through the WEPIA community grants program in 10 governorates. This by far exceeded the original number of grants intended. Also, the majority of the grants were cost shared by the CBOs, which is indicative of the ability of Jordanian CBOs to implement projects if co-financed by donor agencies.

Another interesting issue is that a good proportion of the grants were awarded as revolving grants, which is indicative of the CBOs approach to maximizing the benefits of grants obtained from various entities. Another achievement of the project is the training that was conducted for over 200 CBOs in proposal preparation, financial management, and project supervision. Such training is believed to be an asset for such CBOs in terms of pursuing future grants and participating in future similar programs. The number of families benefiting from the program exceeded preset goal of 2000 families. The assessments clearly indicated that the projects increased the incomes of the beneficiaries. Unfortunately, the majority of the beneficiaries met during the assessments were hesitant to reveal figures on their incomes. However, reductions in expenditures were evident and significant as will be seen in the detailed assessments in the following sections.

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Chapter 1: INTRODUCTION

1.1 OVERVIEW AND PROBLEM STATEMENT

The Hashemite Kingdom of Jordan faces a chronic imbalance in the population–water resources equation. In 1990 the population was nearly four million and the nationwide demand on water was approximately 1,000 million cubic meters. In 2001 the population was estimated at nearly five million with water demand exceeding 1,250 million cubic meters; representing an increase of nearly 25% in both population and demand for water. The available water supply, however, only increased by about 12% (from 850 million cubic meters to 950 million cubic meters) in the same period. The increase in water supply came through greater use of groundwater aquifers, sometimes to levels beyond the safe yield, wastewater reuse, and additional rights to water from the Jordan River System, which the country gained after signing a peace treaty with Israel in 1994. However, the water deficit is expected to continue rising and will likely reach 400 million cubic meters in the year 2020. Furthermore, the daily per capita share of water in Jordan is considered to be one of the lowest in comparison with both world and neighboring country averages. By the year 2025, available annual water sources per capita in Jordan are estimated at 91 cubic meters, compared to 645 cubic meters, 311 cubic meters, and 161 cubic meters in Egypt, Israel, and Syria, respectively.

The inadequate supplies of water and other natural resources have partly been contributing factors to causing debt, poverty, and unemployment to become fundamental problems in Jordan. Nearly 2% of the population earns less than \$1 per day, and another 7.4 % earns less than \$2 per day, thus, placing approximately 30% of the population in below-the-poverty line living conditions. Since the early 1990s, poverty has risen continuously amongst Jordan's population. With nearly one third of the entire population living below the poverty threshold, access to municipal and other vitally important services is unevenly distributed across the regions, and rural areas in the south and northeast of the country are under-served. These shortfalls in service delivery have reduced income opportunities, and low income in turn has decreased people's ability to pay for services.

1.2 ONGOING GOVERNMENTAL REMEDIAL PROGRAMS

In an effort to combat poverty in the Kingdom, the Government of Jordan (GoJ) launched several programs through the Ministry of Planning (MoP). Of those, the Enhanced Productivity Program (EPP) is the most comprehensive program addressing a variety of sectors. The EPP is a government-funded development project based on the premise that the government has a role to play in facilitating the ability of all Jordanians to improve their lives. To that end, the EPP creates opportunities for rural communities to be a part of income-producing and self-sustaining industries. In addition, and unlike previous government initiatives, the EPP focuses on an integrated approach to rural development where one EPP project leads directly to and supports other EPP projects. The end result is individuals and communities generating income and employment in their towns and villages, with the government playing the role of the enabler and supporter.

The EPP has five interrelated components all of which are intended to increase the productivity of individuals and their communities and promote rural development. These components are:

1. The Rural Community Cluster Development Program
2. The Enhanced Productivity Centers Program
3. The Community Infrastructure Program (CIP)
4. Training
5. Small Grants

1.2.1 Community Infrastructure Program

The (CIP) component of the EPP aims at enhancing productivity and rural development through infrastructure projects that support enterprise development in tourism, agribusiness, municipal, and governorates' development. The CIP provides finance for projects in the agribusiness and tourism sectors, and in support of municipal and governorates development, or village cluster projects that may lack funding. It also offers grants to municipalities, local councils and NGOs to support income-generating projects in least developed communities. The CIP is implemented along two parallel tracks; fast track for already identified projects,

and pilot track for long-term economic projects that increase employment and income. The main objectives of the CIP are to:

- Enhance individual, community and regional productivity through infrastructure development
- Develop infrastructure in support of individual, village and regional enterprise development and income generating projects.
- Encourage large-scale infrastructure projects in tourism and agriculture
- Tackle the most pressing infrastructure development priorities of the municipalities and governorates
- Create employment opportunities
- Support infrastructure development for village clusters
- Create an environment in the governorates that is favorable to private sector investment

As mentioned before, one of the main components under the CIP is Agribusiness. With Jordan's rural economy employing a sizeable segment of the labor force, there are yet challenges in the local practices in the way water is used, the crops that are grown, and the markets chosen that reduce the impact of agriculture on Jordan's people. The EPP/CIP agribusiness component seeks to enhance the infrastructure supporting agriculture, improve the living standards of farmers and increase their participation in investment and development. The EPP/CIP's approach to agribusiness is truly multi-faceted. This component employs Fast Track and Pilot Programs to create both immediate and long-term impacts. The disciplines that agribusiness addresses include water use, marketing, extension services, conservation of medical and herbal plants, association building and alternative crop development to expand yield and to expand the choices available to Jordan's farmers.

The document at hand presents the results of an evaluation conducted for two types of small projects; projects that were funded by the MoP's CIP program, which was implemented by the collaboration between the Academy of Educational Development and the Farmer's Association Jordan Valley District Branch (FAJVDB), and projects funded by the United States Agency for International Development

under the Ministry of Water and Irrigation's Water Efficiency and Public Information for Action (WEPIA) program, which is also implemented by the Academy for Educational Development.

1.3 PROJECT DESCRIPTION

As part of the EPP/CIP efforts in agribusiness, the Academy for Education Development and the Farmers Association Jordan Valley District Branch applied for funding to implement a project under the name of ***"Water-related Small Infrastructure Development to Promote Productivity in Rural Areas"***. The main objectives of the proposed project were to increase the total income of farming and other families living in low-income areas of Jordan through structural improvements to existing water networks and construction of new structures. The project also aimed at reducing farmer investment costs that would result in increases in family disposable income.

At the time the application was made, the project was expected to provide up to 50 small grants to community groups, improve the incomes of up to 5000 families as a result of the interventions, improve the incomes of up to 2000 families through decreased expenditures, and train up to 50 Community Based Organizations to conduct financial management of their grants.

At the time the application was made the target group to benefit from the endeavor comprised of:

- 5000 families (pop. 40,000) in Tafila, Madaba, Al Balqa, Maan, Mafraq, Karak, Ajloun and Irbid to be supported through community grants.
- 2000 Farmers to receive support in irrigated agriculture, water harvesting, improvements in water pumping stations, improvements in reservoirs, rehabilitate existing Roman wells and reservoirs.
- 2000 Farmers to receive support in construction of new canals, new reservoirs, small processing plants and equipment, selection of plant stock, ponds for animal husbandry, water systems for poultry plants, cooling systems for poultry, water for alfalfa production for animal feed.
- At the time of submitting the proposal, other activities that were intended for funding included the construction of structures for waste disposal and

re-use related to water (e.g. poultry processing), gray water re-use and recycling for productive trees. Those types of projects, however, were not implemented as will be seen in following sections.

- Villages' population, income levels, geographic location, relationship to water, ability to cost-share up to 10% and previous experience in doing field projects.

1.4 PROGRAM OWNERS, FINANCERS, AND IMPLEMENTERS

As mentioned before, the study at hand assessed two types of small projects; projects that were funded by the MoP's CIP program, and projects funded by the United States Agency for International Development under the Ministry of Water and Irrigation's Water Efficiency and Public Information for Action (WEPIA) program. The former was implemented by the collaboration between the Academy of Educational Development and the Farmer's Association Jordan Valley District Branch (FAJVDB), while the later was solely implemented by the Academy for Educational Development, with assistance early on from the Jordan Forum for Business and Professional Women. The following sections briefly present the involved entities.

1.4.1 Jordan Ministry of Planning (MoP)

Established as a Ministry in 1984, it acts as the national driving force for guiding and coordinating governmental socio-economic policies, programs and priorities as well as enhancing international cooperation for addressing these goals. As mentioned before, the (GoJ) launched the Enhanced Productivity Program (EPP) to combat poverty and addressed a variety of sectors. The envisioned end result of the EPP is individuals and communities generating income and employment in their towns and villages, with the government playing the role of the enabler and supporter.

The EPP has several components, one of which is the (CIP) that aims at enhancing productivity and rural development through infrastructure projects that support enterprise development in tourism, agribusiness, municipal, and governorates' development. One of the CIP's main sub-components is Agribusiness. This sub-component seeks to enhance the infrastructure supporting agriculture, improve the living standards of farmers and increase their participation in investment and development. The EPP/CIP's agribusiness approach employs Fast Track and Pilot

Programs to create both immediate and long-term impacts. The disciplines that agribusiness addresses include water use, marketing, extension services, conservation of medicinal and herbal plants, association building and alternative crop development to expand yield and to expand the choices available to Jordan's farmers. The projects and activities described in this report are part of the Fast Track and Pilot Programs that are funded by the MoP.

1.4.2 Jordan Ministry of Water and Irrigation (MoWI)

Responsible for the overall management and delivery of water for municipal and agricultural use, the Jordan Ministry of Water and Irrigation carries several activities to remedy water shortage in Jordan, such as *water demand management*. Demand management has proven to be very important for coping with climate change, both because it promotes efficiency and because it enables a considerable amount of flexibility in water resource management. As part of its continuing efforts to develop water demand management strategies, the MoWI launched the Water Efficiency and Public Information for Action (WEPIA) program. This five-year project is implemented in collaboration with the Academy for Educational Development and is funded by the United States Agency for International Development. The project deploys social marketing techniques to promote the use of water saving devices (WSDs) on domestic water fixtures. A significant portion of the WEPIA activities in Jordan involves a community grants' program to fund projects similar to those funded by the MoP CIP agribusiness program. More details on the nature of those projects are presented in the following section.

1.4.3 The Academy for Educational Development (AED)

The Academy for Educational Development is a US-based non-profit agency that implements development projects worldwide. It is awarded a cooperative agreement with USAID to work on water conservation in Jordan for a period of five years. The Academy is one of the largest non-profit agencies supporting USAID and other International Donor agencies worldwide. They implement more than 250 programs in over 160 countries and the United States. Program areas include Health and Education, Workforce Development, Global learning and Leadership, and Social Change amongst others. It has a worldwide staff of more than 1000 technical persons and an annual operating budget of \$154 million dollars.

In Jordan the AED implements the Water Efficiency and Public Information for Action (WEPIA) program funded by USAID, collaborating with the Ministry of Water and Irrigation. Part of WEPIA, as mentioned before, includes a community grant program. The community grants program supports small projects implemented by Community Based Organizations that aim at conserving water and improving the standards of living as a result. To date, a total of \$130,000 dollars were initially allocated for this program. An additional \$100,000 was added at the direct request of His Excellency the Minister for Water and Irrigation, upon review of the program and the benefits to local communities. Considered one of its major successes, the program has funded a total of twenty-seven grants. All funding activities are intended to; a) reduce the expenses of the poor by bringing greater efficiency to water systems in the rural or urban sector and; b) increase productivity of rural populations through interventions in on-farm water use.

1.4.2 The Farmers' Association Jordan Valley District Branch (FAJVDB)

The Jordan Valley Farmers' Association (JVFA) was originally founded in the year 1974 under temporary Governmental Statute No. 14 of the Hashemite Kingdom of Jordan. It was later renamed the Farmers' Association Jordan Valley District Branch as part of the General Farmers' Association. The mission of the FAJVDB is to promote the personal and professional growth of all people involved in agriculture. The FAJVDB purposes include; developing leaders in the agricultural sector, inspiring agricultural service, strengthening agricultural communities, and enhancing the success potential for Jordanian agriculture, especially the beginning farmers. The FAJVDB accomplishes its mission through programs and services designed to provide a national framework to inspire personal achievement, educational opportunities to build business and environmental stewardship skills, and leadership and service opportunities for living and working in a local and global community.

The vision of the FAJVDB is a world where all people value and understand the vital role of agriculture, water, food, fiber, and natural resource systems in advancing personal and global well being. Currently, the FAJVDB offers the following services:

- ❖ Representing the agricultural community at the governmental level with entities such as the Ministries of Agriculture, Ministry of Water and Irrigation, and the Jordan Valley Authority.

- ❖ Assisting the Jordan Valley farming community in the subsidized purchase of their basic commodities, such as irrigation equipment, fertilizers, chemicals, pesticides, etc.
- ❖ Introduce new irrigation technologies to the Jordan Valley farming community.
- ❖ Assist local farmers in the marketing of their crops and the processing of surplus crops.
- ❖ Assist local farmers in developing water conservation measures (e.g. water harvesting and water recycling)

With agriculture being the largest consumer of water in the region, one cannot overlook the significant interaction between water resources and agriculture. The sustainability of the agricultural sector in the region is heavily dependent on the availability of water, and unless serious measures are taken to provide new water resources, the future of agriculture in the region is uncertain. With the escalating water scarcity problem in the region, it has become necessary to utilize irrigation technology and procedures that optimize water efficiency. Irrigation equipment such as drip and micro drip irrigation has been successfully used in the region. Also, practices such as grey water utilization and rain harvesting have already proven to be effective measures of increasing water use efficiency, thus, improving standards of living in rural communities.

1.5 OBJECTIVE

The objective of this study was to survey a sample of the projects implemented through the community grants program. The evaluated projects included both projects funded through the AED/FAJVDB Ministry of Planning's EPP/CIP fund, and the WEPIA project's community grants program. The evaluation was to be met through documentation and quantification of improvements resulting from the implemented projects. Other objectives of the study were to study various performance indicators, which included the following

- Baseline for the income(s) and/or expenditures of the monitored cases.
- Increase(s) in income, if any.
- Decrease in expenditures, if any.

- Drop out cases (where applicable) of beneficiaries and/or discontinued activities.
- Social change occurring on the direct beneficiaries level of community level (mobility, marketing, attitude, decision making)
- Improvements in life quality (hygiene, saved time, saved effort) and quantifying such improvements
- Unintended results, whether positive or negative.
- Attitudes and opinions of the local community towards the grants, its implementation, management, benefits, shortcomings and recommendations.

The consultant, the Interdisciplinary Research Consultants (IdRC) conducted all the field surveys and structured interviews to arrive at the above objectives.

1.6 OUTLINE OF OTHER CHAPTERS

The document at hand comprises of four chapters. The first chapter presents a background on the problem and the objectives of the evaluation. The second chapter summarizes the methodology followed to meet the objectives of the study at hand, while chapter three presents the findings and results of the evaluation. Finally, chapter four presents the lessons learned and conclusions/recommendations to be considered in future endeavors.

Chapter 2: METHODOLOGY

As mentioned before, the objective of the AED/FAJVDB collaboration was the provision of up to 50 project small grants provided to community groups that were expected to improve the standard of living of up to 2000 families through improvements of income and/or reductions in cost. The program also aimed to provide Jordanian Community Based Organizations (CBOs) with proper training to enable them to conduct financial management of their grants. The grants were planned to finance projects that included; water harvesting, improvements in water pumping stations, improvements in reservoirs, rehabilitation of existing Roman Reservoirs, construction of new canals, new reservoirs, plants and equipment, water reservoirs for animal farms, and new innovations in agriculture requiring water infrastructure. The improvement projects were to be awarded in the poorest 8 governorates; Ma'an, Tafeeleh, Karak, Madaba, Ajloun, Balqa, Mafraq and Irbid. The WEPIA Community Grants Program had a similar nature, however, it addressed CBOs in ten governorates.

Section 2.1 of this chapter ***briefly*** summarizes the methodology followed by the joint venture in preparing, awarding, and implementing those improvement projects. Section 2.2 presents in ***more detail*** the methodology followed by the IdRC technical team in monitoring and evaluating a sample of projects.

2.1 PRE-PROJECT IMPLEMENTATION METHODOLOGY

To achieve the objectives of the project, the members of the collaboration (i.e., the AED and the FAJVDB) assumed different, yet complementary roles. Considering the vast experience of the AED in rural economic development and capacity building, it was one of the AED's objectives to build the capacity of the FAJVDB and better equip them to manage and implement such sizeable grants. ***It should be mentioned, however, that there was a strict time constraint imposed by the Ministry of Planning on the project management team (i.e., the FAJVDB/AED collaboration). The entire project duration was one year, during which all capacity building, project marketing, CBO training, proposal reviews/field visits, and project implementation/completion had to be completed. Considering, the large number of the grants to be awarded, and the wide***

Table 3. Final List of Grants under the AED/FAJVDB

General information				Financial		
Name of CBO	Project title	village/ city	group gender	Total cost (JD)	% sharing	Revolving (Y/N)
MAAN						
1. Ayl ch.	reservoir and canal main.	Ayl	mixed	4950	10	N
2. Prince Rashid soc.	grey water refining	alqaa	mixed	3000	10	N
3. Basta ch. Soc	main. For the spring and canal lining	Ayl	mixed	2720	18	N
4. Basta co. soc	main. And lining for canals	Ayl	mixed	2420	10	N
5. Al Rajef ch. Soc	spring main. And canal lining	Petra	mixed	1368	10	N
6. Al Rajef co. soc	completion of piping	Petra	mixed	4300	50	N
7. Al Moqareyah ch. Soc	canal lining	Shobak	mixed	1000	10	N
8. Southern Taybeh ch.	reservoir covering and piping	Taybeh	mixed	1490	10	N
9. Maan ladies	reservoir and planting medecinal and herbal plants	Maan	F	3516	10	Y
10. Al Onsor co. soc	water gathering pool construction	Shobak	mixed	4500	25	N
TAFEELAH						
11. Rwaim ch. Soc	canal lining and re-enforced concrete construct to water gathering	Rowaim	mixed	4725	10	N
12. Dhana co. soc	construction of reservoir and canal lining main	Dhana	mixed	4500	10	N
13. Karma co. soc	water pipe main.	Gharandal	mixed	1000	20	N
14. Dhana ch. Soc	construct a new canal	Dhana	mixed	3800	10	N
15. Kameya jaes abu shattal co. soc	pipe installation	Tafeelah	mixed	2000	25	N
16. Aimah ch. Soc	water reservoir and canal lining	Aimah	mixed	4752	10	N
17. Fatima Alzahraa ch. Soc	grey water refining	Bseera	F	3000	10	N
18. Bseera ch. Soc	canal construction and canal lining	Bseera	mixed	5000	10	N
KARAK						
19. Alemtayaz co. soc	spring main. And canal const.	Mazar	mixed	5000	10	N
20. Al Mazar ch. Soc	reservoir	Mazar	mixed	3000	20	N
21. That ras ch. Soc	canal lining	That ras	mixed	4000	10	N
22. Al Fajj co. soc	Roman reservoir main.	Mazar	mixed	4000	15	N
23. Ayy ch. Soc	reservoir const. and main.	Ayy	mixed	2700	10	Y
24. Umm humat ch. Soc	reservoirs const.	Muaab	mixed	1500	10	N
25. Ghour Assafi ch. Soc	pools const. and pumping unit	Ghour alsafi	mixed	4000	10	Y
26. Jdaydeh ch. Soc	reservoir const.	Jdaydeh	mixed	2700	10	N
27. Al Zahraa ch. Soc	spring development and canals	Alzahraa	F	5000	10	N
28. Khaldeyyah ch. Soc	reservoirs const.	Khaldeyyah	mixed	6300		N
MADABA						
29. Alfajer co. soc	reservoirs const.	Madaba	mixed	1000	10	N
30. Khaled Ibn Alwaleed ch. Soc	reservoirs drilling	Theeban	mixed	3700	10	N
31. Abdurrahman Ibn Awf ch. Soc	main. For the spring and reservoir	Madaba	mixed	6000	20	N
32. Almathloutha ch. Soc	reservoir const. and plastic piping	Mathloutha	mixed	5000	10	N
33. Althuhaiba ch. Soc	Roman reservoir main.	Thuhaibah	mixed	3700	10	N
34. Alnahdha ch. Soc	well drilling and main.	Theeban	mixed	3700	10	N
35. Alaqsa ch. Soc	reservoir const.	Madaba	mixed	2000	10	N
36. Aldhuha co. soc	reservoir const.	Madaba	mixed	1000	15	N

Table 3 (cont'd). Final List of Grants under the AED/FAJVDB

Name of CBO	Project title	village/ city	group gender	Total cost (JD)	% sharing	Revolving (Y/N)
MAFRAQ						
3. Badeya development co. soc	reservoir const.	Zumlet Ghazi	mixed	3800	10	N
38. Alkhaldeyyah ch. Soc	grey water refining	Khaldeyyah	mixed	3000	15	N
39. Alkoum Alahmar ch. Soc	Cistern construction	Koum alahmar	mixed	3450	10	N
4. East of Mafraq co. soc	water gathering cistern construction	Sabha o Sobheyyah	mixed	1500	10	N
41. Abnaa deir Alkahf co. Soc	reservoir const. and pumping unit	Deir alkahf	mixed	3500	10	N
42. Alkherbeh alsamra ch. Soc	grey water refining	Kherbah Samra	mixed	3200	10	N
4. Thaghret aljub ch. Soc	water harvesting	Thaghret aljub	mixed	2000	15	Y
44. Buwaidet alolaimat ch. Soc	water harvesting	Buwaidah	mixed	3200	10	Y
45. Balaama ch. Soc	water harvesting	Balaama	mixed	2900	10	Y
4. Koum arraf ladies ch. Soc	planting of medicinal and herbal plants	Koum alraf	F	1300	10	N
BALQAA						
47. Bushes employees co. soc	reservoir main.	Kamaleyyah	mixed	5000	10	N
4. Reef lady co. soc	water harvesting	Maaddi	F	3000	10	Y
49. Farmers Union Maaddi	modern irrigation systems dev.	Deir alla	mixed	6352	10	N
LOUN						
4. Ras muneef ch. Soc	Cistern construction	Ras muneef	mixed	2700	10	Y
51. Fatima azzahraa co. soc	reservoir const. and planting medicinal and herbal	Ain janna	F	3000	10	N
4. Assaif co. soc	wells and reservoir const.	Anjara	mixed	2700	10	Y
4. Reef Anjara co. soc	reservoirs const.	Anjara	mixed	2700	20	Y
54. Sakhra ladies ch. Soc	Cistern construction	Sakhra	F	2700	15	Y
4. Halawa ladies ch. Soc	reservoir const. and planting medicinal and herbal	Halawa	F	3000	10	N
4. Ballas ch. Soc	Cistern construction	Ballas	mixed	2700	10	Y
57. Farmers Union	reservoirs const.	Ajloun	mixed	3000	10	N
BED						
4. Kufr awan ch. Soc	Cistern construction	Kufur awan	mixed	2700	10	N
59. Kufr almaa ch. Soc	Cistern construction	Kufr almaa	mixed	3240	10	N
4. Kharaj ladies ch. Soc	Cistern Construction	Alkharaj	F	2700	10	Y
4. Union ch. Soc	water piping	Masharea	mixed	3420	20	Y
62. Yubla ch. Soc	canal const.	Yubla	mixed	3600	10	N
4. Erhaba ch. Soc	reservoirs const.	Erhaba	mixed	3800	10	N
4. Alyarmouk ch. Soc	Cistern construction	Kufur soum	mixed	913	10	N
65. Northern vallies ladies	water piping	Wadi alrayyan	F	3500	10	N
4. Kufr soum ch. Soc	Cistern Construction	Kufur soum	mixed	3500	20	N
4. Tubneh ch. Soc	Cistern construction	Tubneh	mixed	3700	15	Y
68. Jdaitta ch. Soc.	canal lining	Jdaitta	mixed	6930		N

Table 4. Final List of Grants Under the WEPIA Community Grants

Name of group	Project title	Village/ town	group gender	Total grant (JD)
TAJLOUN				
1. Jabal Al-Akhdar Cooperative society	Cisterns construction and maintenance	Jabal Al-Akhdar	women	5730
Al-Hilal charitable society	Cisterns construction and pistachio plantations	Shkara/ Fakhira/ Sakhina/ Safina	mixed	5151
AMMAN				
Productive Woman cooperative	Reservoir and drip irrigation system	Marka	women	5000
4 The cultural society for youth and childhood	Water awareness program for university students	Amman	mixed	3305.88
Al-Hussein society for the habilitation and rehabilitation of the physically challenged	Therapeutic pool repair	Amman	mixed	7000
6. Productive woman cooperative society	Nursery for drought tolerant plants	Marka	women	9336
AQABA				
7. Red Crescent society	Residential network repair and education	Aqaba city	mixed	5000
8. Red Crescent society	Residential network repair and education	Aqaba city	mixed	5370
BAJQA				
9. Rural Woman Co-operative society	Revolving fund for water efficient programs	Der Alla	women	7000
IRBID				
10. Jdatta Charitable Society	Concrete water canals	Jdatta	mixed	3525
11. Aidoon Charitable society	Reservoir, concrete canals and drip irrigation system	Aidoon	women	4100
12. Mkheba Foga charitable society	House network repair and WSDs	Mkhebe Foga	mixed	5595
ERASH				
13. Khadeeja bint Khuwailid cooperative society	Nursery for drought tolerant plants	Raymoon	women	5114
KARAK				
14. Smakiya Charitable Society	Cisterns construction	Smakrya	mixed	3500
15. Al-Zahra' charitable society	Cisterns construction and repair	Zahra'	mixed	6000
16. Taibeh voluntary society	Repair and rehabilitation of 3 water springs	Taibeh	mixed	9330
17. Imtiyaz Cooperative Society	Water harvesting and irrigation reservoirs	Nueimat villages	men	6000
MAAN				
18. Mgar'iyeh Voluntary Society	Canal lining with plastic pipes	Mgar'iyeh	mixed	4500
19. Zubayriyya Voluntary Society	Replacement of cement canals with plastic pipes	Abu-Makhtooob	mixed	2930
20. Onsor Cooperative Society	Replacement of cement canals with plastic pipes	Jaye	mixed	3750
21. Jhayyir Voluntary Society	Rehabilitation of spring and plastic pipes	Jhayyir	men	3180
MADABA				
22. Grayyat and Oder voluntary society	Roman cisterns repair	Grayyat	mixed	7000
23. Mleh voluntary society	Drip irrigation systems and bee keeping	Mleh	mixed	9150
24. AbdulRahman Ibn Auf voluntary society	Gray water systems	Madaba city	mixed	4000
25. Rahma Voluntary Society	Water harvesting cisterns	Theeban	men	6000
TAFEELAH				
26. Gharandal charitable society	Repair of house network and water tanks	Gharandal	mixed	3113
27. Bsera charitable society	Water reservoir	Bsera	mixed	4600

2.1.9 Additional Activities

In addition to the activities outlined above, the project team assisted the CBOs in preparing progress reports, monitoring and random visits, supervision of projects, project hand over, preparing project snag lists, overseeing project exit strategies, and final reporting.

2.2 POST-PROJECT MONITORING AND EVALUATION

The monitoring and evaluation (M&E) of development projects generally entails periodic collection and analysis of financial and physical data. The analysis of project implementation was deemed important in order to identify the causes for the differences between targets and actual achievement. Thus, an M&E strategy would provide institutions the means for ascertaining problems encountered in implementation and the reasons for any gaps between planned and actual performance; and ensure that such information are regularly provided to management with appropriate recommendations. Unfortunately, the time constraints on this activity did not allow for the development of a comprehensive system. Therefore, only a sample of the projects developed under this program was assessed. The implemented system helped somewhat establish baseline conditions, and develop the mechanism for quantifying deviations (improvements) to those baseline conditions.

To meet the objectives of the M&E activities at hand, the IdRC team conducted the following tasks

2.2.1 Desk Study and Sample Selection

The purpose of this task was to review, summarize, and document all the activities that were conducted prior to any of the grant awards. Generally, this included documentation of all meetings, governorate meetings, workshops, training activities, site visits, etc. that took place. One of the purposes of this task was to evaluate the effectiveness of the process of publicizing the project to the target population(s) and governorates. The effectiveness of the process was evaluated through determinations of response rates (i.e., proposals submitted versus people invited/trained to prepare and submit proposals). This process helped identify the strengths and weaknesses in the publicity and proposal solicitation processes. Once

documented and entered into the evaluation system, it would help enhance the process for extensions/expansions of the grants programs by the MoP.

The desk study also addressed the proposals that were submitted and categorized them to accepted proposals and rejected proposals, and looked into the details of the rejected proposals.

2.2.2 Sample Selection

The IdRC study team looked at all the awarded grants (total 68 +27 grants) and selected a representative sample for inclusion into the M&E system. It should be mentioned again that the sample included both projects funded under the AED/JVFA program and projects under the WEPIA program.

Although it was preferable to select the sample on a completely random basis; it was deemed more appropriate to stratify the selection process. The purpose of the stratification was to guarantee selection of projects in all the participating governorates and to cover all types of projects financed by the program. Therefore, the projects were categorized according to geographic location and according to project nature, and projects were randomly drawn from those sub-categories. In total, 17 AED/JVFA projects out of 68 projects were selected (25%) and 12 WEPIA projects out of the first WEPIA phase of 18 completed projects were selected (67% of the total). A list of the CBOs selected for monitoring and evaluation is included in the Appendix.

2.2.3 Field Assessments

Once the study sample was determined, the IdRC study team reviewed in more details all the documentation pertaining to those sites/projects. The study team then conducted field visits to those sites and met the beneficiary (ies) in order to gather the data relating to baseline or pre-project conditions, and post-project conditions. Those data include income, water consumption, nature of activity, etc. Although a portion of those data could have been extracted from the proposals, face-to-face interviews with the beneficiaries helped refine those data in a more accurate manner. The study team held visits with the CBO, the CBO management, individual grantees, and in some cases members of the grantees families. Generally, the following data were collected

- Pre-Project incomes/expenditures of the monitored cases.
- Post-Project income/expenditures (or projected according to valid indicators)
- Drop out cases (where applicable) of beneficiaries and/or discontinued activities, and reasons.
- Social change occurring on the direct beneficiaries level of community level (mobility, marketing, attitude, decision making)
- Improvements in life quality (hygiene, saved time, saved effort) and quantifying such improvements
- Unintended results, whether positive or negative.

2.2.3 Surveys

In addition to the data collected in the field surveys and interviews, the IdRC study team assessed the attitudes and opinions of the local community(ies) towards the grants, its implementation, management, benefits, shortcomings and recommendations. This was achieved through the conduct of mini-survey questionnaire that targeted the community. The sample mostly included members of the beneficiaries' families, and non-beneficiary members of the CBOs. The survey was conducted in the form of structured interviews where a series of questions were asked to the interviewed individuals.

2.2.4 Data Analysis and Documentation

All the collected data were analyzed to produce statistics and indicators such as:

- Most successful (with reference to expectations) projects in terms of meeting objectives (mainly economically) and reasons for success
- Factors contributing to success/failure of project(s)
- Most frequent obstacles/constraints and ways of improvement
- Most promising areas for investment (irrigation equipment, reservoirs, etc.)
- Project economic feasibility indicators and cash flow analyses for future projections
- Project social indicators (size of impacted beneficiaries families, communities, etc.)

Chapter 3: RESULTS

As mentioned earlier, a number of small project grants were provided to community groups that were expected to improve the standard of living of up to 2000 families through improvements of income and/or reductions in cost. The program also aimed to provide Jordanian Community Based Organizations (CBOs) with proper training to enable them to conduct financial management of their grants. The grants were planned to finance projects that included; water harvesting, improvements in water storage and delivery systems, improvements in reservoirs, rehabilitation of existing Roman reservoirs, construction of new canals, new reservoirs, and new innovations in agriculture requiring water infrastructure (e.g., non-traditional crops). The FAJVDB/AED improvement projects were awarded in the poorest 8 governorates; Maan, Tafelah, Karak, Madaba, Ajloun, Balqa, Mafrak and Irbid, while the WEPIA Community Grants were awarded in ten governorates.

This chapter presents the results of the project. However, it focuses on the findings of Monitoring and Evaluation activities conducted for a number of those implemented projects. Section 3.1 and 3.2 present in *detail* the results and the findings on the assessed projects funded by the AED/FAJVDB collaboration and WEPIA grants program, respectively. Section 3.3 presents general remarks on the analyzed projects, and section 3.4 presents the results of the survey that was conducted and expands on some of the socio-economic aspects of the program.

3.1 AED/FAJVDB PROJECTS

The following sections present the findings of the M&E activities conducted for the AED/JVFA projects. A total of 17 projects are presented. For each project, a general description of the project outlining its objectives, benefits and main aspects is presented. Following that, the indicators and assumptions used to estimate the economic feasibility analysis are described. This includes, savings, reductions in expenditures, maintenance costs, etc. The economic feasibility analyses are then presented and their results depicted in terms of the projects' Net Present Values (NPV), Benefit-Cost Ratio (B/C), and investment recovery period. It should be mentioned that all analyses were conducted assuming an 8% annual rate of return. Finally, conclusions and recommendations drawn from the project are described.

Depending on the nature of the project and its operational status, economic feasibility analyses for some of the projects could not be conducted.

3.1.1 Cistern construction and Water Harvesting in Jdaydeh Charitable Society (Karak)

Jdaydeh is a small community located in the northern part of Al Karak Governorate. The village is known for its cattle farming industry (mainly sheep), and is infamous for its dairy products (butter, jameed, and margarine). The problem, however, is that the majority of the sheep growing farms are not serviced with water, leading the farmer owners to transport water via tractors from a spring that is nearly a-25 kilometer haul, at least twice a week.

To overcome this problem, the CBO applied for a grant to construct cisterns on individual farms with the purpose of rainwater harvesting. As a result, the CBO was awarded a grant of JOD 2,700 to which the CBO added JD 900 (JD 300 in cost sharing and another JD 600 eventually paid by the beneficiaries). The CBO announced to local residents about the availability of the grant and six farmers were selected as a result. In total, 6 farms with total area 30 Dunums were equipped with pear shaped cisterns with a cement catchment basin to collect rainwater. The average size of each cistern was nearly 30 cubic meters. The main benefit of the cisterns was that it increased on-farm water availability and it partly eliminated the need to transport water via tractors, thus reducing farmers' expenditures.

The IdRC study team visited the CBO in Al Karak, met the manager and held structured conversations with two beneficiaries, and then visited some cistern locations and documented them using photos.

The following summarizes the main aspects of the project:

- Increase on-farm water availability for beneficiaries.
- Reduce beneficiaries' water related expenditures.
- Save the travel time consumed by transporting water from the source.
- Enable beneficiaries to more efficiently water their animals, thus, increase their incomes.
- Numbers of the direct beneficiaries are 6 persons.

- Numbers of the in direct beneficiaries are 150 persons.



Taha Thuneibat, one of six sheep growers in Jdaydeh that were able to reduce their on-farm water expenditures. With cisterns on their farms, those farmers have eliminated the need to transport water from a nearby spring in the winter.

3.1.1.1 Economic Analysis

In order to conduct the economic feasibility analyses for the project, the IdRC extracted certain water consumption and expenditure indicators from the beneficiaries during the structured interviews. Those indicators would help quantify the benefits of the project and conduct its economic feasibility analysis. Table 5 below summarizes those indicators. Table 6 summarizes the cash flow values and economic feasibility results for the project over its lifetime.

Table 5. Summary Indicators for Jdaydeh Charitable Society

Parameter	Value	Comments
Initial cost	JD 3600	JD 2700 + JD 300 + JD 600
Number of wells	6	
Annual pre-project water cost	JD 1080	JD 15 per farmer per month year round
Annual post-project water cost	JD 360	JD 10 per farmer per month in summer (6months)
Annual savings in water cost	JD 720	
Design life for the well	10 years	
O&M	JD 30	Electricity and well clean up every year

Table 6. Summary of Feasibility Analysis for Jdaydeh Charitable Society

End of Year	Initial Cost	O&M	Benefit	Net Cash Flow
0	-3600	0	0	-3600
1	0	-30	720	690
2	0	-30	720	690
3	0	-30	720	690
4	0	-30	720	690
5	0	-30	720	690
6	0	-30	720	690
7	0	-30	720	690
8	0	-30	720	690
9	0	-30	720	690
10	0	-30	720	690
NPV				JD 1030
B/C				1.28
Recovery				7.5 years

3.1.1.2 Conclusions and Recommendations

As can be seen from the financial analysis, the project is an economically feasible one, with an NPV of nearly JD 1000, and a benefit cost ratio exceeding one. In conclusion the project has met its objective in increasing the efficiency of water use, has reduced farmers expenditures and benefited nearly 150 individuals. It is recommended that such projects be duplicated, however, it is also recommended that the grants be given in a revolving manner. For instance, for this particular case, a re-payment of JD 5 per month from each farmer (i.e., half their savings) would allow the addition of a new well every twenty months, each with a net return of JD 120 per year.

3.1.2 Roman Reservoir Rehabilitation in Al-Fajj Society (Karak)

Al-Fajj is an area near Mutah in the southern part of Al Karak Governorate. With old Roman Reservoirs in the area, it has become an attraction for sheep and cattle growers as an area to water cattle especially in the summer time. Unfortunately, until recently, those reservoirs had not been well maintained over the years, which has caused them to become filled with soil eroded by rain, this reduced their holding capacity. In addition, the lack of maintenance has reduced the amount of water

draining into them, which has led cattle farmers to often purchase tanks to fill up the wells.

To assist with solving the problem, the CBO applied for a grant to rehabilitate three Roman reservoirs in the area. As a result, the CBO was awarded a grant of JOD 4,000 (the CBO contributed JD 700). In total, three reservoirs with holding capacities of 70, 150, and 500 cubic meters were rehabilitated. The main benefit of the reservoirs was that it increased water availability to cattle farmers with farms established in the vicinity of these reservoirs and farmers that bring their cattle to the reservoirs for watering. It has helped reduce the amount of water tankers that were frequently brought in to fill the reservoirs, thus reducing farmers' expenditures.

The IdRC study team visited the Al Fajj Society in Al Karak, met the manager and held prolonged visits with some of the beneficiaries on the site. The following summarizes the main aspects of the project:

- Increase water availability for local cattle growers
- Reduce beneficiaries' water expenditures by reducing the need to haul water to this remote area
- Enable beneficiaries to water their animals (nearly 4000 heads of sheep and 200 cows per year during certain seasons) at no cost.
- Numbers of the direct and indirect beneficiaries are 360 persons.



In Fajj, cattle farmers benefit from this rehabilitated Roman Reservoir with a capacity of nearly 500 m³. The new reservoir has eliminated those farmers' needs to buy tankers to meet their cattle's water demand. Being a somewhat remote area with low accessibility, the prices of water tanks are excessively high. The project has resulted in tremendous water expenses' reductions.

3.1.2.1 Economic Analysis

In order to conduct the economic feasibility analyses for the project, the IdRC extracted certain water consumption and expenditure indicators from the beneficiaries during the structured interviews. Those indicators would help quantify the benefits of the project and conduct its economic feasibility analysis. Table 7 below summarizes those indicators. Table 8 summarizes the cash flow values and economic feasibility results for the project over its lifetime.

Table 7. Summary Indicators for Al Fajj Charitable Society

Parameter	Value	Comments
Initial cost	JD 4700	JD 4000 + JD 700
Number of reservoirs	3	Total Capacity 720 cubic meters
Annual pre-project water cost	JD 5,600	Arrived at through interviews by determining the total number of heads watered and their daily water requirements
Annual post-project water cost	JD 4,120	
Annual savings in water cost	JD 1,480	
Design life for the reservoirs ^b	10 years	It is very safe to assume that the design life is significantly higher considering that these reservoirs are hundreds of years old
Maintenance	JD 150	Reservoir clean up every year

3.1.2.2 Conclusions and Recommendations

As can be seen from the financial analysis, the project is an economically feasible one, with an NPV of nearly JD 4,000, and a benefit cost ratio significantly exceeding one. In conclusion the project has met its objective in increasing the efficiency of water use, has reduced farmers expenditures and benefited nearly 360 individuals. It is recommended that such projects be duplicated and other roman reservoirs in the area be rehabilitated. However, it is also recommended the project attempt to generate an income in order to expand its scope. For instance, for this particular case, a minimal reservoir use fee from each farmer would help the rehabilitation of new reservoirs and possibly equipping the existing reservoirs with electric pumps to reduce waiting time for farmers.

Table 8. Summary of Feasibility Analysis for Al Fajj Charitable Society

End of Year	Initial Cost	Maintenance	Benefit	Net Cash Flow
0	-4700	0	0	-4700
1	0	-150	1480	1330
2	0	-150	1480	1330
3	0	-150	1480	1330
4	0	-150	1480	1330
5	0	-150	1480	1330
6	0	-150	1480	1330
7	0	-150	1480	1330
8	0	-150	1480	1330
9	0	-150	1480	1330
10	0	-150	1480	1330
NPV				JD 4,200
B/C				1.89
Recovery				4.5 years

3.1.3 Well Drilling and Water Harvesting in Zahra Charitable Society (Karak)

Zahra is a small town in the northern part of Karak Governorate. The township is serviced with water but water delivery to subscribers is inefficient, weak, and unreliable, especially in the summer. To make up for this, the inhabitants usually purchase water via tanks from nearby springs. It was desired to deploy water-harvesting techniques from roof houses, with the water drained into reservoirs, which can be later pumped into roof tanks. The total size of the grant received by this CBO

was JD 2,500, which was enough to construct 3 reservoirs and rehabilitate 2 old cisterns at unit costs of JD 600 and JD 300 respectively. The main benefit of the reservoirs is to reduce beneficiaries' expenditures in purchasing water from tanks. With a revolving fund, the re-payments would allow for the construction of additional reservoirs.

The IdRC study team visited the Al Zahra Society in Karak, met the manager, visited some reservoir locations, and talked to some beneficiaries.



Zahra resident Mr. Khamayseh has significantly reduced his water expenditures through the construction of this rainwater-harvesting cistern in his backyard. With low water delivery pressure, he usually is obliged to purchase water tankers for use at home; an obligation that this cistern has eliminated. His 120-m² roof runs off enough water to fill his cistern.

The following summarizes the main aspects of the project:

- The grant is revolving between the beneficiaries in the Society with each family re-paying JOD 20 per month. At this rate, after the first year, two reservoirs can be added. This rate would increase as years go by.
- The project increases water availability for beneficiaries.
- The project reduces beneficiaries' water expenditures (demand reduced from up to thirty 3-m tanks per family per year to nearly 20 3-m tanks per family per year).
- Enable some families to irrigate their yards and orchards, thus, increase their incomes
- Numbers of the direct beneficiaries are 5 households.
- Numbers of the indirect beneficiaries are 50 persons.

3.1.3.1 *Economic Analysis*

Past experience has shown that rainwater-harvesting cisterns are not very economically feasible, unless supplemented by an additional income generating activity (e.g., high value crop irrigation, cattle farming, etc.). The main benefits of such systems are increasing water availability for residences, and reducing water related expenditures (usually in the form of water purchased via tankers). The reductions in water expenditures are not high enough to economically justify the cost of such a system. The additional benefits of the system, such as comfort, satisfaction, water efficiency, all contribute to making such systems attractive to residents of rural areas where water delivery pressure can sometimes be sporadic or weak.

To conduct the economic feasibility analyses for the project, the IdRC extracted certain water consumption and expenditure indicators from the beneficiaries during the structured interviews. Those indicators would help quantify the benefits of the project and conduct its economic feasibility analysis. Table 9 below summarizes those indicators. Table 10 summarizes the cash flow values and economic feasibility results for the project over its lifetime.

Table 9. Summary Indicators for Al Zahra Water Harvesting Reservoir Project

Parameter	Value	Comments
Initial cost	JD 2500	
Initial number of wells	5	3 new wells and 2 old cisterns rehabilitated
Annual pre-project water cost	JD 750	30 tanks per family annually at JD 5 per tank
Annual post-project water cost	JD 500	20 tanks per family annually at JD 5 per tank
Annual savings in water cost	JD 250	3 new cisterns added every three years
Design life for the project	10+ years	

3.1.3.2 *Conclusions and Recommendations*

As can be seen from the financial analysis, and in line with past experience, rainwater-harvesting cisterns are generally unfeasible economically unless supplemented by another income generating source. The NPV for this particular endeavor is negative, and the benefit cost ratio is less than 1. This does not indicate, however, the failure of the project. For instance, an additional saving of JD 100 for the beneficiaries of this project would turn a project into a feasible one in a

ten-year period. In other words, if each beneficiary can further utilize the well to reduce their expenditure/or increase their income by an additional JOD 20 annually, the project would become feasible. In conclusion the project has met its objective in increasing the efficiency of water use, has reduced beneficiaries' water-related expenditures and benefited nearly 50 individuals in the first year. It is recommended that such projects be duplicated in surrounding areas, especially in locations that are not serviced with water. The social benefits of these kinds of projects are well worth the expense.

Table 10. Summary of Feasibility Analysis for Al Zahra Society

End of Year	Initial Cost	Benefits	Net Cash Flow
0	-2500	0	-2500
1	0	250	250
2	0	250	250
3	0	250	250
4	0	250	250
5	0	250	250
6	0	250	250
7	0	250	250
8	0	250	250
9	0	250	250
10	0	250	250
NPV			JD -820
B/C			0.67
Recovery			22 years

3.1.4 Reservoir Construction By Farmers Association (Ajloun)

The Farmers' Association Ajloun District Branch is a small branch with only nine active members. This project is its first experience in community based grants and is, thus, believed to have the dual benefit of increasing water efficiency and building the capacity of a local CBO to pursue additional funds. Ajloun has a high precipitation rate, and most irrigation is rain fed. The area serviced by this project is a small area just north of the City of Ajloun that is home to 6 farms, one of which is a cow farm. To utilize the rainwater, the proposed project included a reservoir for rainwater harvesting and an irrigation network to deliver water from the reservoir to the individual farms. The size of the grant was only enough to construct the reservoir. The total size of the grant was JD 3,000 (supplemented by JD 1,700 from

the CBO), which was used to construct an 80 cubic meter reservoir and a water-harvesting concrete basin. The main benefit of the reservoir is to increase water availability for those six farms and reduce expenditures related to water, especially the animal farm. Unfortunately, and due to the lack of an irrigation network linked to the reservoir, the project cannot say that it has increased water efficiency. However, the availability of water harvested in the reservoir will have a positive impact once an irrigation network is in place.

The IdRC study team visited the CBO, held structured conversations with some of the beneficiaries, and toured the reservoir location.

The following summarizes the main aspects of the project:

- The project helps increase water availability for the beneficiaries, and once an irrigation network is installed, the increase of efficiency of water application will be achieved.
- Should the irrigation network be completed, the project would achieve the following:
 1. Increase water availability for beneficiaries.
 2. Increase of water efficiency application during irrigation
 3. Numbers of the direct beneficiaries are 6 households.
 4. Numbers of the indirect beneficiaries are 60 persons.

Due to the project's operation status, no detailed economic feasibility analysis was conducted. Furnishing an irrigation network will have the additional impact of improving yield, thus increasing farmers' incomes, which would reduce the recovery period for the investment.

3.1.4.1 Conclusions and Recommendations

Although not fully utilized at this time, it is believed that the completed tank, supplemented with an irrigation network, will have a positive impact. It is highly recommended that the FA pursue additional funds (possibly through the Ministry of Planning) to finance an irrigation network.

3.1.5 Reservoir, Irrigation Network and Medicinal Plants By Fatima Al Zahraa (Ajloun)

Ein Janna is a small town in the Ajloun Governorate. The local CBO is a woman's CBO that is active in the area of training courses (e.g. first aid, accounting) to its members. The purpose of this project was to create an additional source of income to the CBO and its active members. The proposed project was to utilize some tracts of land owned by the CBO to grow medicinal herbs (thyme, camomile, and sage) on a four-donum tract of land to be irrigated by a drip irrigation network fed by gravity from a water reservoir to be constructed as part of the project. The total size of the grant received by this CBO was JD 3,000, which was used to construct a 15 cubic meter reservoir, install the irrigation network, and purchase/plant the medicinal seedlings plants.

The IdRC study team visited project site, met the manager, and then visited the project site.

The following summarizes the main aspects of the project:

- Make water available for an income-generating project (medicinal plants).
- Increase beneficiaries' income from plant yield.
- The project created short-term employment.
- Numbers of the direct beneficiaries are 69 households.
- Numbers of the indirect beneficiaries are 560 persons.

Since no yield has been produced, it is difficult to estimate the income to be generated from the project. However, the CBO has generated marginal income from the sale of seedlings (JD 20 to 30 per year). The visit also revealed that the CBO is having some difficulties maintaining the project. The CBO members are relatively inexperienced in the field of medicinal herbs.

The IdRC study team also concludes that it may have been more efficient to build a rainwater harvesting reservoir rather than a reservoir to be filled by tanks. The CBO incurs an annual cost of nearly JD 120 in water tankers, a cost that can be reduced via rainwater harvesting

3.1.6 Drip Irrigation Network By Al Etihad Charitable Society (Irbid)

This project is located in Al Masharaa in the Irbid Governorate front on the Jordan Valley. Being a rich agricultural area, most CBOs in the Jordan Valley are of an agricultural nature and the majority of their members are farmers as well. Unfortunately, a high percentage of farmers in Jordan still rely on open surface irrigation techniques, which have low water efficiency. The Al Etihad CBO applied for a grant to install modern irrigation networks (drip irrigation) on members' farms to grow vegetables.

The CBO was granted JD 3420, which was matched by JD 850 from the CBO. The amount was enough to purchase and install four drip irrigation systems only. To maximize the benefit, the CBO allocated funds to its members on a revolving basis, to allow for the installation of new systems as the beneficiary farmers make their payment. To date, a fifth system has been installed as a result of the revolving payments.

The IdRC study team visited the Al Etihad Charitable Society, met the manager, held interviews with some of the beneficiaries, and visited some of the beneficiaries' farm sites.

The following summarizes the main aspects of the project:

- Increase water efficiency and yield for beneficiaries.
- Reduce beneficiaries' water expenditures
- Enable some beneficiaries to increase the planted areas on their farms due to the increased water delivery efficiency (areas were doubled in some cases).
- Numbers of the direct beneficiaries are 5 households.
- Numbers of the indirect beneficiaries are 45 persons.

3.1.6.1 Economic Analysis

In order to conduct the economic feasibility analyses for the project, the IdRC extracted certain water consumption and expenditure indicators from the beneficiaries during the structured interviews. Those indicators would help quantify the benefits of the project and conduct its economic feasibility analysis. Table 11

below summarizes those indicators. Table 12 summarizes the cash flow values and economic feasibility results for the project over its lifetime.



Members of Etihad CBO in the Jordan Valley deploying irrigation networks on their farms has helped them use water more efficiently. Before the installation of the networks, open surface irrigation was used. The systems have allowed them to irrigate their farms with less water.

3.1.6.2 Conclusions and Recommendations

As can be seen from the financial analysis, the project is an economically feasible one, with an NPV of nearly JD 4,000, and a benefit cost ratio significantly exceeding one. In conclusion the project has met its objective in increasing the efficiency of water use, has reduced farmers expenditures and benefited nearly 100 individuals. It is recommended that such projects be duplicated and the principle of revolving funds encouraged since it has proven successful and maximizes the benefits.

Table 11. Summary Indicators for Al Etihad Charitable Society

Parameter	Value	Comments
Initial cost	JD 4275	JD 3420 + JD 855
Number of systems	4	A fifth system has been added with revolving the fund
Annual pre-project water cost	JD 1,700	Nearly JD 340 per year per farmer (average)
Annual post-project water cost	JD 800	JD 160 per year per farmer (average)
Annual savings in water cost	JD 900	Additional savings in fertilizer estimated at JD 50 per farmer annually
Design life for the network	5 years	After which beneficiaries are assumed to be able to rehabilitate their networks from their savings/profits in previous years

Table 12. Summary of Feasibility Analysis for Al Etihad Charitable Society

End of Year	Initial Cost	Water Savings	Fertilizer Savings	Net Cash Flow
0	-4275	0		-4275
1	0	900	200	1100
2	0	900	200	1100
3	0	900	200	1100
4	0	900	200	1100
5	0	900	200	1100
NPV				JD 120
B/C				1.03
Recovery				5 years

3.1.7 Canal Maintenance and Storage Reservoir By Kufr Sum Society (Irbid)

The village of Kufr Sum is a small community in the Irbid Governorate. Although springs are present to supply water for irrigation to nearby farms, the majority of the existing delivery canals are not lined, thus leading to excessive water losses, and are mostly eroded, which hinders the flow of water. This has decreased the amounts of water delivered to farms, which in turn has affected the yield of those farms and negatively impacted the incomes of the farm owners. In addition, such inefficiency in water delivery, has led many farmers to purchase water via tankers, which overburdens their budgets and increases their expenditures, especially in the summer.

The CBO applied for a grant to line an existing 500-m canal and rehabilitate two eroded springs. The CBO was awarded a grant of JD 3,500 to which the CBO added JD 875. The main benefit of the project is to increase the efficiency of water delivery, reduce losses from eroded springs, and reduce farmers' expenditures in purchasing water via tankers.

The IdRC study team visited the project site, and met the manager and some of the beneficiaries.

The following summarizes the main aspects of the project:

- Increase water availability for beneficiaries.
- The project serves 44 donums from agricultural land.
- Reduce beneficiaries' water expenditures (eliminated a water incurred cost of JD 500 per month).
- Enabled some families to irrigate their yards, thus, increase their incomes
- Numbers of the direct beneficiaries are 60 households.
- Numbers of the indirect beneficiaries are 300 persons.

3.1.7.1 Economic Analysis

In order to conduct the economic feasibility analyses for the project, the IdRC extracted certain water consumption and expenditure indicators from the beneficiaries during the structured interviews. Those indicators would help quantify the benefits of the project and conduct its economic feasibility analysis. Table 13

below summarizes those indicators. Table 14 summarizes the cash flow values and economic feasibility results for the project over its lifetime.

Table 13. Summary Indicators for Kufr Sum Society

Parameter	Value	Comments
Initial cost	JD 4375	JD 3500 + JD 875
Length of canal	500 m	
Annual pre-project water cost	JD 2,520	Nearly JD 7 per month per farm in the summer for supplementary irrigation
Annual post-project water cost	N/A	Enhanced delivery has eliminated the need to haul water via tankers
Annual savings in water cost	JD 2,520	
Design life for the project	5 years	
Maintenance	JD 500	Annual clearing of springs and cleaning canal from erosion and silt

Table 14. Summary of Feasibility Analysis for Kufr Sum Society

End of Year	Initial Cost	Water Savings	Maintenance	Net Cash Flow
0	-4375	0		-4375
1	0	2520		2520
2	0	2520	-500	2020
3	0	2520	-500	2020
4	0	2520	-500	2020
5	0	2520	-500	2020
NPV				JD 4,153
B/C				1.9
Recovery				2.5 years

3.1.7.2 Conclusions and Recommendations

As can be seen from the financial analysis, the project is an economically feasible one, with an NPV of nearly JD 4,000, and a benefit cost ratio significantly exceeding one. In conclusion the project has met its objective in increasing the efficiency of water use, has reduced farmers expenditures and benefited nearly 300 individuals. It is recommended that such projects be duplicated in surrounding areas. It is also recommended that the beneficiaries pay a subscription fee from their savings to be geared towards maintenance and possibly widening of the canal in the future.

3.1.8 Roman Reservoir Rehabilitation By Tubneh Society (Irbid)

Tubneh is a small town in the Irbid Governorate. Although the town is serviced with water, water delivery to subscribers is inefficient, weak, and unreliable, especially in the summer. To make up for this, the inhabitants usually purchase water via tanks. It was desired to deploy water-harvesting techniques from higher lands, with the water drained into existing Roman Reservoirs. The total size of the grant received by this CBO was JD 3700, which was matched by JD 650 from the CBO. The grant was enough to rehabilitate eight Roman Reservoirs at the time with an average unit cost of JOD 500 per well. The main benefit of the wells is to reduce beneficiaries' expenditures in purchasing water from tanks and increasing water availability for domestic and agricultural uses.

The IdRC study team visited the CBO in Irbid, met the manager, held structured conversations with some of the beneficiaries, and then visited some well locations.



Tubneh olive farmers are now utilizing rehabilitated Roman Reservoirs with capacities of up to 400 cubic meters to collect rainwater for supplementary irrigation, thus, eliminating the need to purchase water. The families are also benefiting from those wells for domestic uses.

The following summarizes the main aspects of the project:

- Increase water availability for beneficiaries.
- Service area nearly 40 dunums
- Reduce beneficiaries' water expenditures (a monthly water demand cost was eliminated).
- Enable some families to irrigate their lands, thus, increase their incomes
- Number of the direct beneficiaries is 8 households.

- Number of the indirect beneficiaries is 80 persons.

3.1.8.1 *Economic Analysis*

Table 15 below summarizes the indicators used in the feasibility analysis. Table 16 summarizes the cash flow values and economic feasibility results for the project over its lifetime.

Table 15. Summary Indicators for Tubneh Society

Parameter	Value	Comments
Initial cost	JD 4350	JD 3700 + JD 650
Number of wells		
Volumes of wells	100 to 400 m ³	
Annual pre-project water cost	JD 1200	Average monthly expenditure of nearly JD 12 per family to purchase tanks
Annual post-project water cost	N/A	Water expenditure nearly eliminated
Annual savings in water cost	JD 1200	
Design life for the project	10+ years	
Maintenance	JD 20	Annual clearing from erosion and silt

Table 16. Summary of Feasibility Analysis for Tubneh Society

End of Year	Initial Cost	Water Savings	Maintenance	Net Cash Flow
0	-4350	0		-4350
1	0	1200	-20	1180
2	0	1200	-20	1180
3	0	1200	-20	1180
4	0	1200	-20	1180
5	0	1200	-20	1180
6	0	1200	-20	1180
7	0	1200	-20	1180
8	0	1200	-20	1180
9	0	1200	-20	1180
10	0	1200	-20	1180
NPV				JD 3,500
B/C				1.8
Recovery				4.5 years

3.1.8.2 Conclusions and Recommendations

As can be seen from the financial analysis, the project is an economically feasible one, with an NPV of nearly JD 3,500, and a benefit cost ratio significantly exceeding one. In conclusion the project has met its objective in increasing the efficiency of water use, has reduced farmers expenditures and benefited nearly 80 individuals. It is recommended that such projects be duplicated in surrounding areas. It is also recommended that the beneficiaries pay a subscription fee from their savings to be geared towards maintenance of the wells and possibly rehabilitating additional wells.

3.1.9 Spring Rehabilitation By Abdul Rahman Ibn Awf Society (Madaba)

This project entailed the rehabilitation of eroded springs in the Madaba governorate to service nearly 60 surrounding farms. Although abundant, the springs in the area that were not efficiently used and some of them did not discharge water effectively due to erosion. The project aimed at rehabilitating those springs, and gathering the water discharge in reservoirs, which could be then delivered to surrounding farms. The total size of the grant received by this CBO was JD 6,000, which was supplemented by JD 1500 from the CBO. The grant was adequate to rehabilitate 14 springs and construct 5 reservoirs. The main benefit of the spring rehabilitation and reservoir construction was to increase water availability and efficiency.

The IdRC study team visited the CBO and toured the site accompanied by the CBO manager and two of the beneficiaries. The following summarizes the main aspects of the project:

- 80% of the project is completed (2 reservoirs are unfinished yet, and are expected to be finished by the end 2003). The three completed reservoirs have a capacity of 290 cubic meters (180 m³, 80 m³, and 30 m³)
- The project caused an increase in water discharge from the springs and increase water availability for beneficiaries (e.g. before the project, a 30 m³ reservoir needed a week to be filled due to the low discharge rate, as a result of the project the reservoir fills up on a daily basis).
- With the increased availability of water, some farmers considering to expand their farms.
- Numbers of the direct beneficiaries are 55 farmers.

- Numbers of the indirect beneficiaries are 500 persons.
- The grant was not enough to protect the rehabilitated springs with retaining walls. Some of the springs have eroded again after the rain season
- Some springs need to be equipped with pipe.
- Remaining springs at risk to erode again unless retaining walls are constructed.



The rehabilitation of those springs in Madaba and the construction of storage reservoirs is allowing Guava farmers in the area to store an additional 9000 cubic meters to irrigate this high value crop annually.

The main benefits of the project were the increase in water availability and water efficiency. The efficiency at some of the springs has quadrupled with the improved water discharge from the wells. As mentioned before, a 30-m reservoir now has the ability to collect an additional 9,000 cubic meters per year. The value of those waters is not less than 4 to 5 thousand Dinars. Combined with the improved production of Guavas that are grown in the area, the benefits by far exceed the costs of the project.

With the possibility of erosion of some of the springs, it is recommended that the beneficiaries allocate parts of their increased income towards supporting the springs with retaining walls to ensure their sustainability.

3.1.10 Reservoir Construction By Al Aqsa Society (Madaba)

This project serves a school for the disabled in the Madaba Governorate that is managed by the CBO. The school, which is new, is not serviced with water and the nearest water main is nearly 1 kilometer away. This leads the school and CBO

management to purchase water for domestic use via tankers. The purpose of the project was to build a reservoir that would help as a storage facility for water once the area became serviced. The size of grant received was JD 2000 complimented by an additional JD 200 from the CBO. This grant was enough to construct a 50 cubic meter concrete reservoir.

The IdRC study team visited the site and met with the manager and spoke with some of the school employees. The project has not completely met its objective because the school has not been connected to the Water Authority of Jordan's (WAJ) service network. However, once operational it is expected to benefit nearly 300 persons, mainly the school students by furnishing the ability to store at least 50 meters of water on top of what the school stores in roof tanks. This will eliminate any need to purchase water via tankers (estimated at JD200 per month).

It can be conclude that this project will be very feasible once the school becomes serviced from WAJ. The recovery period of the project would be a little over a year. It is recommended that the FA provide political support to CBOs receiving grants for projects that will not operate immediately, or projects whose operation will depend on the availability of other funds and grants in order to catalyze the benefits of the projects.

3.1.11 Reservoir Construction By Badia Development Society (Mafrak)

The Badia Development Society in Mafrak applied for a grant to construct a water storage reservoir that could be used for irrigation. The intended reservoir was to collect runoff from a side wadi that would help residences nearby to use the collected waters. The CBO received a grant of JD 3,800 to which it contributed JD 400. The grant was enough to construct a 225 cubic meter reservoir. The proximity of the reservoir to the side wadi ensured rapid fill up of the reservoir for later use. The idea is similar to rainwater harvesting cisterns, but on a large scale. As with rainwater harvesting cisterns, such reservoirs are not very economically feasible, unless supplemented by an additional income generating activity (e.g., high value crop irrigation, cattle farming, etc.). The main benefits of such systems are increasing water availability for residences, and reducing water related expenditures (usually in the form of water purchased via tankers). The reductions in water expenditures are not high enough to economically justify the cost of such a system. The additional

benefits of the system, such as comfort, satisfaction, water efficiency, all contribute to making such systems attractive to residents of rural areas where water delivery pressures can sometimes be weak. In its worst case, assuming that the reservoir would be filled by the end of the rain season, the reservoir for this project would relieve the community from the cost of 225 cubic meters priced at JD 1.8 per meter.

The IdRC study team visited the Badia CBO and held structured conversations with the manager and some beneficiaries.

The following summarizes the main aspects of the project:

- Increase water availability for beneficiaries, which include residents or surrounding areas and the CBO itself, which owns an area planted by trees.
- Enable CBO to supply water, thus, decrease beneficiaries' expenditure.
- Numbers of the direct beneficiaries are 77 households, and indirect beneficiaries are 132 persons.

3.1.11.1 Economic Analysis

Table 17 below summarizes the indicators used in the feasibility analysis. Table 18 summarizes the cash flow values and economic feasibility results for the project over its lifetime.

Table 17. Summary Indicators for Badia Development Society

Parameter	Value	Comments
Initial cost	JD 4200	JD 3800 + JD 400
Volume of reservoir	225 m ³	
Annual value of collected water	JD 400	Assuming the reservoir would be full at the end of the rainy season
Design life for the project	10+ years	
Maintenance	JD 20	Annual clearing from silt

Table 18. Summary of Feasibility Analysis for Badia Development Society

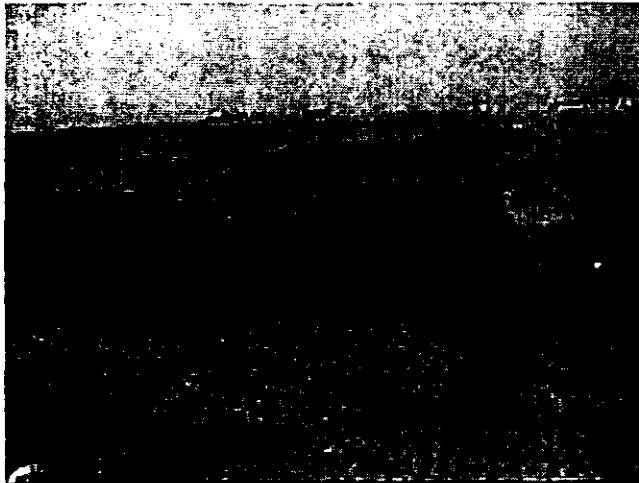
End of Year	Initial Cost	Water Savings	Maintenance	Net Cash Flow
0	-4200	0		-4200
1	0	400	-20	380
2	0	400	-20	380
3	0	400	-20	380
4	0	400	-20	380
5	0	400	-20	380
6	0	400	-20	380
7	0	400	-20	380
8	0	400	-20	380
9	0	400	-20	380
10	0	400	-20	380
NPV				JD -1,651
B/C				0.60
Recovery				27 years

3.1.11.2 Conclusions and Recommendations

As can be seen in the economic analysis, and in line with past experience, the project seems to be economically infeasible. However, it meets the objectives of reducing the expenditures of beneficiaries. The project will recover its expenses, however, the recovery period is a little long. The actual lifetime of the reservoir will exceed 10 years if well maintained, which means that the project can eventually turn feasible. It is recommended that projects with a slow recovery rate be supplemented by additional income generating activities. For example, this project will also be utilized to irrigate some lands to be planted by the CBO. This will contribute to the income generated by the project, thus increase its feasibility.

3.1.12 Water Gathering Pool By East Mafrak Society (Mafrak)

This project is similar to that implemented by the Badia Society. The main purpose of the pool was to collect runoff water from the nearby side wadi to serve farms in the vicinity (nearly 20 donums of agricultural land). The total size of the grant received by this CBO was JD 1,500 (matched by JD 300). The limited size of the grant was not enough to construct a concrete reservoir in the Wadi. Therefore, the project was replaced by a regular pool lined with mulch with a capacity of 1000 cubic meters.



The completion of this 1000 cubic meter reservoir will help farmers in Mafraq to irrigate crops that can be used as animal feed to support the animal industry in the area.

The main benefit of the pool is to increase availability and reducing the expenditures of buying water via tankers.

The IdRC study team visited the project and noticed the following aspects:

- Increase water availability for beneficiaries.
- Enable CBO members to irrigate their farms, thus, will increase their incomes.
- The pool will serve sheep raisers and breeders.
- Number of direct beneficiaries is 40 households and number of indirect beneficiaries is 140 persons.

3.1.12.1 Economic Analysis

Although similar in nature to rainwater harvesting cisterns, the large volume of such a reservoir makes it a more attractive (economically feasible) investment. Table 19 below summarizes the indicators used in the feasibility analysis. Table 20 summarizes the cash flow values and economic feasibility results for the project over its lifetime.

Table 19. Summary Indicators for East of Mafrak Society

Parameter	Value	Comments
Initial cost	JD 1800	JD 1500 + JD 300
Volume of reservoir	1000 m ³	
Annual value of collected water	JD 750	At a rate of JOD 0.75 per meter
Design life for the project	10+ years	Provided pool properly maintained
Maintenance	JD 15	Annual clearing from erosion and silt

3.1.12.2 Conclusions and Recommendations

As can be seen in the economic analysis, the project is very feasible with an extremely short recovery period. Although similar in nature to other water harvesting projects, the large size of the reservoirs adds value to the project. The project meets the objectives of reducing the expenditures of beneficiaries. The actual lifetime of the reservoir will exceed 10 years if well maintained, which means that the project can lead to complementary projects that are income generating.

Table 20. Summary of Feasibility Analysis for East of Mafrak Society

End of Year	Initial Cost	Water Savings	Maintenance	Net Cash Flow
0	-1800	0		-1800
1	0	750	-25	725
2	0	750	-25	725
3	0	750	-25	725
4	0	750	-25	725
5	0	750	-25	725
6	0	750	-25	725
7	0	750	-25	725
8	0	750	-25	725
9	0	750	-25	725
10	0	750	-25	725
NPV				JD 3000
B/C				2.6
Recovery				3 years

3.1.13 Reservoir and Canal Maintenance by Ayl Cooperative Society (Maan)

Ayl is a small village in Ma'an Governorate. A spring in the area covers the water needs for the village. The Ayl CBO desired to rehabilitate the 144 cubic meters

gathering reservoir and the 600-meter water delivery canals to increase water-delivery efficiency to the beneficiary farmers who irrigate an area of nearly 300 donums farms. In addition, a water outlet in the bottom of the existing reservoir caused the growth of fungi in the reservoir and often led to its erosion. The total size of the grant received by this CBO was JD 4,950 (supplemented by a match of JD 550 by the CBO). The rehabilitated canals would increase the efficiency of water delivery to farmers and cattle growers.

Upon the site visit and interviews that took place, the IdRC team summarized the following main aspects of the project:

- The project significantly increased water discharge from the spring and increase the water availability for beneficiaries (e.g. farms that took three days to irrigate before the project can now be irrigated in 12 hours).
- With the increased availability of water, some farmers are anticipating higher yields of improved quality.
- The reservoir filling time has been reduced to 8 hours.
- Numbers of the direct beneficiaries are 80 householders.
- Numbers of the indirect beneficiaries are 600 persons.
- A maintenance cost of nearly 800 JD will be incurred to clean the reservoir from the fungi and soils.

3.1.13.1 Economic Analysis

In order to conduct the economic feasibility analyses for the project, the IdRC extracted certain water consumption and expenditure indicators from the beneficiaries during the structured interviews. Those indicators would help quantify the benefits of the project and conduct its economic feasibility analysis. Table 21 below summarizes those indicators. Table 22 summarizes the cash flow values and economic feasibility results for the project over its lifetime.

Table 21. Summary Indicators for Ayl Society

Parameter	Value	Comments
Initial cost	JD 5500	JD 4950 + JD 550
Volume of reservoir	144 cubic meters	
Annual benefits from increased water availability	JD 1500	Value of anticipated increase in production, mainly olive oil as a result of additional water for irrigation.
Design life for the project	10	Provided properly maintained
Maintenance	JD 800	Annual clearing from erosion and silt

3.1.13.2 Conclusions and Recommendations

As can be seen from the financial analysis, the project is an economically feasible one, with an NPV of nearly JD 3,000, and a benefit cost ratio significantly exceeding one. In conclusion the project has met its objective in increasing the efficiency of water use, has reduced farmers expenditures and benefited nearly 600 individuals. It is recommended that such projects be duplicated in surrounding areas. It is also recommended that the beneficiaries pay a subscription fee from their savings to be geared towards maintenance and possibly widening of the canal in the future.

Table 22. Summary of Feasibility Analysis for Ayl Society

End of Year	Initial Cost	Benefits	Maintenance	Net Cash Flow
0	-5500	0		-5500
1	0	1500	-800	1300
2	0	1500	-800	1300
3	0	1500	-800	1300
4	0	1500	-800	1300
5	0	1500	-800	1300
6	0	1500	-800	1300
7	0	1500	-800	1300
8	0	1500	-800	1300
9	0	1500	-800	1300
10	0	1500	-800	1300
NPV				JD 3,000
B/C				1.7
Recovery				5.5 years

3.1.14 Canal Lining by Mghariyah Society (Maan)

This project was jointly funded by the AED/JVFA and the WEPIA community grants programs. The project area is in Shobak in northern Maan. An area in excess of 2000 donums that is planted with olives and other orchards depends on a nearby spring for irrigation. With reduced precipitation rates in the past years discharge from the spring has been continuously decreasing. The water is delivered from the spring to the farms via earth canals. To overcome the decrease in spring discharge, it was desired to convey the water via a 4-inch pipeline (with total length of 3000 m). The increased water delivery efficiency was expected to compensate for some of the reduction in spring discharge. The CBO received a total grant of JD 6,500 (JD 4,500 from the WEPIA program and JD 2000 from the JVFA/AED program). The pipeline has been completed and is currently operational.



Olive growers in Mgariyah have increased their olive production by 250 oil containers valued at JD 6,250 annually as a result of delivering water efficiently to the farms via a water main.

The main aspects of the project are as follows

- Increase water delivered from the spring and Increase water availability for beneficiaries despite the spring's reduced outflow.
- Olive oil productivity has increased by 10% due to increased water availability.
- Number of the direct beneficiaries is 190 householders and number of the indirect beneficiaries is nearly 1500 persons.

3.1.14.1 Economic Analysis

In order to conduct the economic feasibility analyses for the project, the IdRC extracted certain water consumption and expenditure indicators from the beneficiaries during the structured interviews. Those indicators would help quantify the benefits of the project and conduct its economic feasibility analysis. Table 23 below summarizes those indicators. Table 24 summarizes the cash flow values and economic feasibility results for the project over its lifetime.

Table 23. Summary Indicators for Mghariyah Society

Parameter	Value	Comments
Initial cost	JD 6500	CBO and beneficiaries contributed an additional 25%
Length of pipe	3 Km	
Annual pre-project olive production	2500 oil containers	Valued at JD 62,500
Annual post-project water cost	2750 oil containers	Valued at JD 68,750
Annual benefits from increased water availability	JD 6,250	Value of additional water as a result of the increase in discharge
Design life for the project	5	Provided pipeline properly maintained
Maintenance	JD 500	Pipe maintenance

Table 24. Summary of Feasibility Analysis for Mghariyah Society

End of Year	Initial Cost	Benefits	Maintenance	Net Cash Flow
0	-6500	0		-6500
1	0	6250	-500	5700
2	0	6250	-500	5700
3	0	6250	-500	5700
4	0	6250	-500	5700
5	0	6250	-500	5700
NPV				JD 1600+
B/C				3.4
Recovery				1.5 years

3.1.14.2 Conclusions and Recommendations

As can be seen from the financial analysis, the project is an economically feasible one, with an extremely high NPV, and a benefit cost ratio significantly exceeding one. In conclusion the project has met its objective in increasing the efficiency of water use, has reduced farmers expenditures and benefited nearly 1500 individuals. It is recommended that such projects be duplicated in surrounding areas. It is also recommended that the beneficiaries pay a subscription fee from their savings to be geared towards maintenance and possibly widening of the canal in the future. It is also recommended that a subscription fee be collected from the beneficiaries to further improve water delivery distribution and the installation of modern irrigation networks, and possibly adding new crop varieties.

3.1.15 Water Main by Karameh Society (Tafeelah)

The Grandal spring is an area in Tafeelah and provides water for irrigation for and cattle watering. The Karameh CBO is responsible for maintaining and operating the spring and is an agreement with the beneficiary farmers to do so. The spring discharges into a 70 cubic meter storage reservoir constructed by the Canadian Embassy in 1998. The CBO desires to install a 2 km water main to transport water from the tank to the surrounding farms to replace the deteriorating existing canals. The size of the grant received by this CBO was JD 1000, which was matched by JD 250 from the CBO. The size of the grant was only adequate to complete 500 m of the desired length.

The following summarizes the main aspects of the project:

- Increase water availability for beneficiaries.
- Enable some families to irrigate their yards, thus, increase their incomes
- Numbers of the direct beneficiaries are 47 households.
- Numbers of the indirect beneficiaries are 300 persons.

the main benefit of the project was in reducing conflicts between farmers over water turns. It is recommended that the beneficiary farmers re-pay somewhat of a subscription fee to help extend the length of the main to the original desired length.

3.1.16 Canal Lining by Dhana Society (Tafeelah)

Dhana is a small town in the Tafeelah Governorate. The inhabitants rely on a spring that delivers water via a small canal. The existing canal is deteriorated leading to excessive losses and inefficient delivery of water. The Dhana CBO applied for a grant to rehabilitate the canals and construct a storage reservoir. The total size of the grant received by this CBO was JD 4500 (matched by JD 500 by the CBO). The main benefit of the channel is to reduce water losses and increase water availability.

The IdRC study team visited the project site and concluded the following

- The project increases water delivery by 50 to 60% (estimated from the comparison of Manning coefficient for a deteriorated and improved canal lining).
- There is an estimated increase of 10 to 12 cubic meters per day of water delivery in the winter time, with an annual average increase of nearly 6 cubic meters per day due to reduction in discharge during the summer.
- The project enables some families to irrigate their yards, thus, increase their incomes
- Number of direct beneficiaries is 200 households.
- Number of the indirect beneficiaries is 1000 persons.
- The population of the village is mostly old, with little attention given to farms.

3.1.16.1 Economic Analysis

In order to conduct the economic feasibility analyses for the project, the IdRC extracted certain water value indicators from the beneficiaries during the structured interviews. Those indicators would help quantify the benefits of the project and conduct its economic feasibility analysis. Table 25 below summarizes those indicators. Table 26 summarizes the cash flow values and economic feasibility results for the project over its lifetime.

Table 25. Summary Indicators for Dhana Society

Parameter	Value	Comments
Initial cost	JD 5000	JD 4500 + JD 500
Annual benefits from increased water availability	JD 1000	Value of additional water as a result of the increase in discharge estimated at 6 cubic meters per day, with an average value of JD 0.5 per cubic meter
Design life for the project	10	Provided properly maintained
Maintenance	JD 100	Annual clearing from erosion and silt

3.1.16.2 Conclusions and Recommendations

As can be seen from the financial analysis, the project is an economically feasible one, with an NPV of nearly JD 1,000, and a benefit cost ratio significantly exceeding one. In conclusion the project has met its objective in increasing the efficiency of water use, has reduced farmers expenditures and benefited nearly 1000 individuals. It is recommended that such projects be duplicated in surrounding areas. It is also recommended that the beneficiaries pay a subscription fee from their savings to be geared towards maintenance and possibly widening of the canal in the future.

Table 26. Summary of Feasibility Analysis for Dhana Society

End of Year	Initial Cost	Benefits	Maintenance	Net Cash Flow
0	-5000	0		-5000
1	0	1000	-100	900
2	0	1000	-100	900
3	0	1000	-100	900
4	0	1000	-100	900
5	0	1000	-100	900
6	0	1000	-100	900
7	0	1000	-100	900
8	0	1000	-100	900
9	0	1000	-100	900
10	0	1000	-100	900
NPV				JD 1,000
B/C				1.2
Recovery				9 years

3.1.17 Water Efficiency Projects by Rural Women Cooperative Society (Balqa)

The projects implemented by this CBO were both funded by the AED/JVFA and the WEPIA community grants programs. This CBO is probably one of the most active of all the visited CBOs with a variety of projects financed by a variety of agencies such as the GTZ, and other entities. The CBO has a wide membership base and even operates income-generating activities such as a dairies factory. The CBO is located in of Deir Alla in the Jordan Valley, which is mostly an agricultural area. This CBO follows an approach different from the other CBOs, where once it receives a grant, it is loaned to a number of members with each member implementing her own project and re-paying the loan in the form of payments to enable the CBO to grant loans to other members. Projects implemented included irrigation networks, water reservoirs, house plumbing networks, rainwater harvesting reservoirs, and fertigation equipment. The CBO received total grants of JD 10,000 from both programs (i.e., AED/JVFA and WEPIA). The IdRC study team visited the CBO, met the manager held various site visits, and held prolonged visits with some beneficiaries and their family members.

The main aspects of the projects implemented by this CBO:

1. The grant is revolving between the beneficiaries in the Society with each family re-paying JOD 20 per month.
2. The projects increase water efficiency and availability for beneficiaries.
3. The projects reduce agriculture related expenditures such as water and fertilizers.
4. Enable some families to irrigate their yards, thus, increase their incomes
5. Projects also have a domestic nature where some plumbing networks were rehabilitated.
6. Numbers of the beneficiaries exceeds 400 individuals

3.1.17.1 Economic Analysis

Tables 27 and 28 summarize the economic indicators and economic feasibility analyses for one of the projects implemented by the CBO; a fertigation pump. Generally the average size of each loan granted by the CBO was JD 600, which was always supplemented by the beneficiary by an average of JD 100 to 200 to complete

the project. Other projects implemented by the CBO included a rainwater harvesting reservoir (36 cubic meters) and rehabilitation of house networks. As mentioned in earlier projects, those projects are not very feasible unless complemented with additional income generating activities. The projects have the advantage, however, of increasing water available to families in rural areas.

Table 27. Summary Indicators for Fertilizer Pump Project

Parameter	Value	Comments
Initial cost	JD 500	
Annual pre-project fertilizer cost	JD 250	
Annual post-project fertilizer cost	JD 100	Cost significantly reduced as a result of the increase in fertilizer application efficiency
Annual savings in water cost	JD 150	
Design life for the project	5 years	
Maintenance	JD 20	Clearing

Table 28. Summary of Feasibility Analysis Fertilizer Pump Project

End of Year	Initial Cost	Benefits	Maintenance	Net Cash Flow
0	-500	0		-500
1	0	150	-20	130
2	0	150	-20	130
3	0	150	-20	130
4	0	150	-20	130
5	0	150	-20	130
NPV				JD 20
B/C				1.04
Recovery				5+ years

3.1.17.2 Conclusions and Recommendations

As can be seen from the financial analysis, the projects are economically feasible ones, with positive NPVs, and a benefit cost ratios exceeding one. In conclusion the projects have contributed to meeting the objectives in increasing the efficiency of water use and agricultural production, has reduced farmers expenditures, and benefited nearly 400 individuals. It is recommended that such projects be duplicated in surrounding areas.

3.2 WEPIA PROJECTS

3.2.1 Rainwater Harvesting Projects by Jabal Akhdar Society (Ajloun)

Al Jabal Al Akhdar is located in the Ajloun Governorate. The community has only recently become serviced with water. Despite this, water delivery to subscribers is inefficient, weak, and unreliable, especially in the summer. To make up for this, the inhabitants usually purchase water via tanks from nearby springs. With the high precipitation rates in the area, it was desired to deploy water-harvesting techniques from roof houses, with the water drained into wells, which can be later pumped into roof tanks. The total size of the grant received by this CBO was JD 5,000, which was enough to construct 8 wells at the time with a unit cost of JOD 600 to 750 per well. The main benefit of the wells is to reduce beneficiaries' expenditures in purchasing water from tanks. With a revolving nature the re-payments have also allowed for the construction of 3 additional wells to reach a total of 11 wells, each with a capacity of 25 to 30 cubic meters.

The IdRC study team visited the AL Jabal Al Akhdar Co. Society in Ajloun, met the manager, held structured conversations some of the beneficiaries, and then visited some well locations.

The following summarizes the main aspects of the project:

- The grant is revolving between the beneficiaries in the Society with each family re-paying JOD 20 per month. At this rate, after the first year, three wells can be added, which the CBO actually did. This rate would increase as years go by.
- The project increases water availability for beneficiaries.

- The project reduces beneficiaries' water expenditures (demand reduced from seven 6-m tanks per family per year to two to three 6-m tanks per family per year).
- Enable some families to irrigate their yards, thus, increase their incomes
- Numbers of the direct beneficiaries are 11 households.
- Numbers of the indirect beneficiaries are 85 persons.
- Eight new wells can be constructed every three years

3.2.1.1 *Economic Analysis*

In order to conduct the economic feasibility analyses for the project, the IdRC extracted certain water consumption and expenditure indicators from the beneficiaries during the structured interviews. Those indicators would help quantify the benefits of the project and conduct its economic feasibility analysis. Table 29 below summarizes those indicators. Table 30 summarizes the cash flow values and economic feasibility results for the project over its lifetime.

Table 29. Summary Indicators for Jabal Akhdar Water Harvesting Reservoir Project

Parameter	Value	Comments
Initial cost	JD 5000	
Initial number of wells	8	3 additional wells were constructed from re-payments
Annual pre-project water cost	JD 512	7 to 8 tanks per family annually at JD 8 per tank
Annual post-project water cost	JD 130	2 to 3 tanks per family annually at JD 8 per tank
Design life for the project	10+ years	

Table 30. Summary of Feasibility Analysis for Jabal Akhdar Society

End of Year	Initial Cost	Benefits
0	-5000	0
1	0	382
2	0	382
3	0	382
4	0	382
5	0	382
6	0	382
7	0	382
8	0	382
9	0	382
10	0	382
NPV		JD -2,400
B/C		0.51
Recovery		10 years ++

3.2.1.2 Conclusions and Recommendations

As can be seen from the financial analysis, and as with other similar projects, rainwater-harvesting cisterns are infeasible unless supplemented by another income generating source. The NPV for this particular endeavor is negative, and the benefit cost ratio is less than 1. This does not indicate, however, a failure of the project. On the contrary, the project has met its objective in increasing the efficiency of water use, water availability, has reduced beneficiaries' water-related expenditures, and benefited nearly 80 individuals in the first year. It is recommended that such projects be duplicated in surrounding areas, especially in locations that are not serviced with water.

3.2.2 Rainwater Harvesting Projects by Al Hilal Society (Ajloun)

This CBO is also in the Ajloun Governorate. The community has also only recently become serviced with water. Despite this, water delivery to subscribers is inefficient, weak, and unreliable, especially in the summer. To make up for this, the inhabitants usually purchase water via tanks from nearby springs. With the high precipitation rates in the area, it was desired to deploy water-harvesting techniques from high lands, with the water drained into wells and reservoirs for use in domestic and agricultural uses. The total size of the grant received by this CBO was JD 5,150, which was enough to construct 4 wells, maintain 6 reservoirs and plant non-traditional trees at the time with a unit cost of JOD 300 to 600 per beneficiary. The

main benefit of the project is to reduce beneficiaries' expenditures in purchasing water from tanks. With a revolving nature the re-payments will allow for the construction of additional projects.

The IdRC study team visited the CBO in Ajloun, met the manager, held structured conversations some of the beneficiaries, and visited some wells locations.

The following summarizes the main aspects of the project:

- The grant is revolving between the beneficiaries in the Society with each family re-paying JOD 10-20 per month. At this rate, after the first year, four projects can be added. This rate will increase in following years.
- Project increases water availability for beneficiaries.
- Project reduces beneficiaries' water expenditures (demand reduced from ten 12-meter tanks per family per year to only two or three tanks
- Enables some families to irrigate their yards and increase their incomes
- Numbers of the direct beneficiaries are 12 households and 130 persons.

3.2.2.1 *Economic Analysis*

In order to conduct the economic feasibility analyses for the project, the IdRC extracted certain water consumption and expenditure indicators from the beneficiaries during the structured interviews. Those indicators would help quantify the benefits of the project and conduct its economic feasibility analysis. Table 31 below summarizes those indicators. Table 32 summarizes the cash flow values and economic feasibility results for the project over its lifetime.

Table 31. Summary Indicators for Al-Hilal Project

Parameter	Value	Comments
Initial cost	JD 5150	
Initial number of wells and reservoirs	10	4 wells and 6 reservoirs
Number of planted farms	2	
Annual pre-project water cost	JD 600	10 tanks per family annually at JD 6 per tank
Annual post-project water cost	JD 120	2-3 tank per family annually at JD 6 per tank
Annual savings in water cost	JD 480	10 new projects added every three years
Design life for the project	10+ years	

Table 32. Summary of Feasibility Analysis for Al-Hilal Society

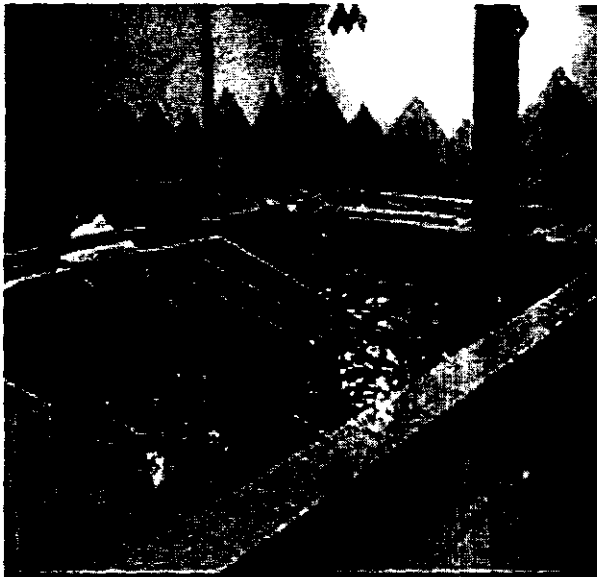
End of Year	Initial Cost	Benefits from first batch	Net Cash Flow
0	-5150	0	-5150
1	0	480	480
2	0	480	480
3	0	480	480
4	0	480	480
5	0	480	480
6	0	480	480
7	0	480	480
8	0	480	480
9	0	480	480
10	0	480	480
NPV			JD -1,900
B/C			0.63
Recovery			10+ years

3.2.2.2 Conclusions and Recommendations

Again, rainwater-harvesting cisterns are infeasible unless supplemented by another income generating source. The NPV for this particular endeavor is also negative, and the benefit cost ratio is less than 1. This does not indicate, however, failure of the project. In conclusion the project has met its objective in increasing the efficiency of water use, has reduced beneficiaries' water-related expenditures and benefited nearly 80 individuals in the first year. It is recommended that such projects be duplicated in surrounding areas, especially in locations that are not serviced with water. This project also included the growing of non-traditional crops such as Thyme. The quantities produces are mainly for domestic uses, which may lead to additional, but minor, savings to some families.

3.2.3 Therapeutic Pool by Al-Hussein Society (Amman)

Al Hussein Society is located in the capital Amman and its one of the societies that serve children with physical challenges. The physiotherapy pool is one of methods, which is used for children recovery. The CBO needed to rehabilitate the pool, which was suffering from excessive water losses from cracks. The total size of the grant received by this CBO was JD 7,000. This was part of the cost needed to rehabilitate the building housing the pool, which cost 50,000 JD. However, this grant contributed to a significant portion of water savings as a result.



WEPIA'S contribution to the rehabilitation of this therapeutic pool has helped significantly reduce water losses, which has enabled the society to help over 100 disabled Jordanian children.

The IdRC study team visited the CBO and toured it. The main accomplishments achieved by the project are:

- ◆ The pool is operating again and has become suitable for children recovery.
- ◆ The rehabilitation eliminated water losses from the pool, which at one time reached 30 cubic meters per week.
- ◆ Numbers of beneficiaries exceeds 100 children with physical challenges.

3.2.3.1 Economic Analysis

In order to conduct the economic feasibility analyses for the project, the IdRC extracted certain water consumption and expenditure indicators from the beneficiaries during the structured interviews. Those indicators would help quantify the benefits of the project and conduct its economic feasibility analysis. Table 33 below summarizes those indicators. Table 34 summarizes the cash flow values and economic feasibility results for the project over its lifetime.

Table 33. Summary Indicators for Al-Hussein Project

Parameter	Value	Comments
Initial cost	JD 7000	Part of a JD 50,000 cost (14%)
Annual pre-project water loss	1560 m ³	Valued at JD 2,340
Annual post-project water loss	0	
Annual savings in water cost	JD 2,340	Savings mostly attributed to WEPIA grant
Design life for the project	20+ years	Financial Analysis shown for 5 years only

Table 34. Summary of Feasibility Analysis for Al-Hussein Society

End of Year	Initial Cost	Net Cash Flow
0	-7000	-7000
1	0	2,340
2	0	2,340
3	0	2,340
4	0	2,340
5	0	2,340
NPV		JD -2,300
B/C		1.33
Recovery		3.5 years

3.2.3.2 Conclusions and Recommendations

As can be seen in the economic analysis, the project is extremely feasible. In addition, it meets the objectives of increasing water efficiency and eliminating leakages, thus reducing the expenditures of beneficiaries. The project will recover its expenses, in a very short period of time. The actual lifetime of the reservoir will exceed 20 years if well maintained. Also, the nature of the project of helping disabled children adds tremendous value to the project.

3.2.4 Drip Irrigation and Water Harvesting by Productive Women Society (Amman)

More than fifteen years ago this project's site was used as a solid waste landfill. The CBO had a vision of rehabilitating the site to plant with drought resistant trees, which would reduce negative environmental impact the landfill may have had. With

reasonable precipitation rates in the area, it was desired to deploy water-harvesting techniques in the project area, with the water drained into 90 cubic meters well. Those waters can be then pumped into a high tank with a 64 cubic meters capacity. Then, water would be delivered to the trees via a drip irrigation network. The total size of the grant received by this CBO was JD 5,000. The main benefit of the project was to create an environmentally sound green area in a previously neglected area, and to increase the efficiency of rainwater utilization, thus minimize any cost related to purchasing water for irrigating the area.

The main accomplishments achieved by the project were to increase water availability for the area, and to minimize irrigation water expenditures (demand reduced from twelve 8-m³ tanks per month to four 8-m³ tanks per month). This translated into an annual water savings valued at JD 1150 (saving 8 water tanks with a capacity of 8-m³ each). Table 35 below summarizes the economic feasibility analysis for the project.

Table 35. Summary of Feasibility Analysis for Productive Women Society

End of Year	Initial Cost	Net Cash Flow
0	-5000	-5000
1	0	1150
2	0	1150
3	0	1150
4	0	1150
5	0	1150
6	0	1150
7	0	1150
8	0	1150
9	0	1150
10	0	1150
NPV		JD 2700
B/C		1.5
Recovery		5 years

As seen in the table, it can be concluded that the project meets its objectives in terms of reducing water, promoting water efficiency techniques, and promoting healthy environments. Again, such a project has the advantage of creating an environmentally friendly area in a rather urban congested area.

3.2.5 Water Efficiency Awareness by Cultural Society for Youth and Childhood (Amman)

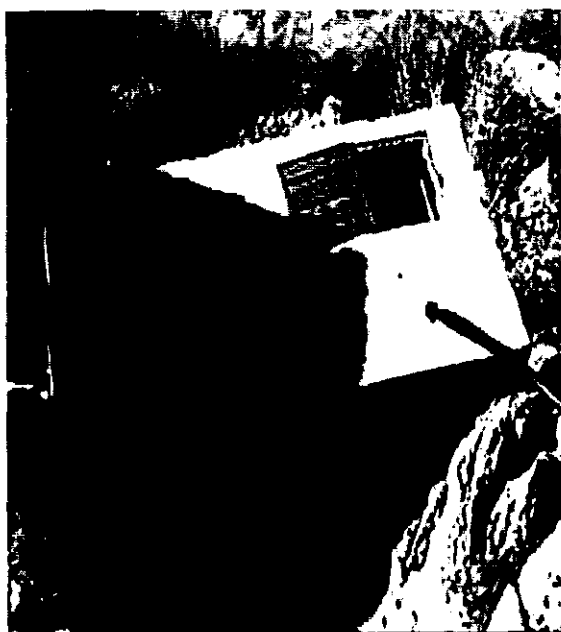
The project implemented by this CBO entailed the conduct of a series of workshops centered around water efficiency. The target population of the workshops was university students. The CBO hosted a number of workshops where they invited university students and key speakers. The workshops also entailed training of trainers to conduct future workshops

From the field visit conducted by the study team it was concluded that although the idea of the workshops may have been sound, it is not sustainable. It is recommended that such projects be only awarded to educational institutions to guarantee sustainability. Utilizing the grant to fund the creation of a new college course (elective) on water efficiency would have had more sustainable effects

3.2.6 Reservoir Construction and Pipe Network by Bseira Society (Tafeelah)

Bseira is located Tafeelah. Although heavily planted with different types of trees, irrigation activities rely on nearby spring that flows to the farms by gravity, which was an inefficient method to deliver water to the farms. The CBO applied for a grant to construct two reservoirs with capacities of 28 and 1.5 cubic meters, respectively. In addition, it was desired to supplement the reservoirs with a 3-inch 500-meter plastic pipeline to deliver water to the farms. The total size of the grant received by this CBO was JD 4600, which was not enough to complete the entire project. The CBO and the beneficiaries contributed an extra JD 1100 to complete it. The main benefits of the project were to reduce water loss, increase the efficiency of water delivery, and increase the water available for irrigation in the nearby farms.

The site visits revealed that the project increased water availability for beneficiaries and reduced water losses and served nearly 350 donums of planted area. Some of the interviews held indicated that some beneficiaries' incomes increased by as much as 20% as a result of irrigating their yards. The number of the direct beneficiaries was estimated at 70 households, while the number of the indirect beneficiaries is estimated at 700 persons.



A reservoir and water delivery main have helped Bseira farmers double their irrigation frequencies and increase the productivity of their farms as a result

3.2.6.1 *Economic Analysis*

Table 36 below summarizes the economic indicators used to quantify the benefits of the project according to feedback received from beneficiaries, while. Table 37 summarizes the cash flow values and economic feasibility results for the project over its lifetime.

Table 36. Summary Indicators for Bseira Project

Parameter	Value	Comments
Initial cost	JD 5700	JD 4600 + JD 1100
Planted area	350 donums	
Pre-project monthly irrigation frequency	1	
Post-project monthly irrigation frequency	2-3	
Benefits	JD 1450	Increased irrigation raised income by 15 to 20%, which was estimated at JD100 per a 5 donums plot
Maintenance	JD 40	Cleaning reservoir and fixing any ruptures
Design life for the project	10+ years	

Table 37. Summary of Feasibility Analysis for Bseira Society

End of Year	Initial Cost	Maintenance	Benefits	Net Cash Flow
0	-5700	0		-5700
1	0	-40	1400	1360
2	0	-40	1400	1360
3	0	-40	1400	1360
4	0	-40	1400	1360
5	0	-40	1400	1360
6	0	-40	1400	1360
7	0	-40	1400	1360
8	0	-40	1400	1360
9	0	-40	1400	1360
10	0	-40	1400	1360
NPV				JD 3,400
B/C				1.6
Recovery				5.5 years

3.2.6.2 Conclusions and Recommendations

As can be seen from the financial analysis, the project is an economically feasible one, with a positive NPV, and a benefit cost ratio exceeding one. In conclusion the project has met its objective in increasing the efficiency of water use, has increased farmers incomes and benefited nearly 800 individuals in the first year. It is recommended that such projects be duplicated in surrounding areas.

3.2.7 Well Drilling and Water Harvesting in Zahra Charitable Society (Karak)

Already introduced as part of the projects funded by the AED/FAJVDB, this CBO also received a grant from WEPIA to construct water harvesting cisterns. The grant received by this CBO was JD 6,300, which was enough to construct a number new wells and rehabilitate old wells at unit costs of JD 600 and JD 300 respectively. In total, 17 wells were operated in houses and in farms. The main benefit of the wells is to reduce beneficiaries' expenditures in purchasing water from tanks. With a revolving nature, the re-payments will allow for the construction of additional wells.

The IdRC study team visited the Al Zahra Society in Karak, met the manager and visited some well locations.

The following summarizes the main aspects of the project:

- The grant is revolving between the beneficiaries in the Society with each family re-paying JOD 20 per month. The number of the direct beneficiaries are 17 households and number of the indirect beneficiaries are 200 persons.
- The project increases water availability for beneficiaries and reduces beneficiaries' water expenditures (demand reduced from up to thirty 3-m tanks per family per year to ten or twenty 3-m tanks per family per year).
- Enable some families to irrigate their yards and orchards, thus, increase their incomes. Three of the wells have been supplemented by drip irrigation networks, which has allowed owners to grow vegetables. An increase of JD 10 to 15 in the owners' monthly income was reported.

3.2.7.1 *Economic Analysis*

In order to conduct the economic feasibility analyses for the project, the IdRC extracted certain water consumption and expenditure indicators from the beneficiaries during the structured interviews. Those indicators would help quantify the benefits of the project and conduct its economic feasibility analysis. Table 38 below summarizes those indicators. Table 39 summarizes the cash flow values and economic feasibility results for the project over its lifetime.

Table 38. Summary Indicators for Al Zahra Water Harvesting Reservoir Project

Parameter	Value	Comments
Initial cost	JD 6,300	
Initial number of wells	17	Some are new drillings and some are rehabilitations
Annual pre-project water cost	JD 1700	20-30 tanks per family annually at JD 5 per tank
Annual post-project water cost	JD 850	10 to 20 tanks per family annually at JD 5 per tank
Annual savings in water cost	JD 850	3 farmers growing vegetables earning JD 10 to 15 per month, additional annual benefit JD 360
Design life for the project	10+ years	

3.2.7.2 *Conclusions and Recommendations*

As can be seen from the financial analysis, the project is an economically feasible one, with a positive NPV, and a very high benefit cost ratio. In conclusion the project has met its objective in increasing the efficiency of water use, has reduced farmers

expenditures and benefited nearly 200 individuals in the first year. It is recommended that such projects be duplicated in surrounding areas.

Unlike other rainwater harvesting cisterns, this project was feasible because it was complemented with irrigation activities to grow vegetables, which has yielded an additional income. This supports the recommendations made on other cistern projects calling for supporting them with income generating activities.

Table 39. Summary of Feasibility Analysis for Al Zahra Society

End of Year	Initial Cost	Benefits	Benefits from vegetables*	Net Cash Flow
0	-6300	0		-6300
1	0	850	360	1210
2	0	850	360	1210
3	0	850	360	1210
4	0	850	360	1210
5	0	850	360	1210
6	0	850	360	1210
7	0	850	360	1210
8	0	850	360	1210
9	0	850	360	1210
10	0	850	360	1210
NPV				JD 1800
B/C				1.28
Recovery				7 years

* See Table 38 for explanation

3.2.8 Water Harvesting in Smakiyah Charitable Society (Karak)

Smakiyah Society was one of the first CBOs to work with the WEPIA grants program. Smakiyah is a small town in the Karak Governorate. It is serviced with water but water delivery to subscribers is inefficient, weak, and unreliable, especially in the summer. To make up for this, the inhabitants usually purchase water via tanks from nearby springs. It was desired to deploy water-harvesting techniques from roof houses, with the water drained into wells, which can be later pumped into roof tanks and used for irrigating areas mainly grown with olive trees. The total size of the grant received by this CBO was JD 3,500, which was enough to construct 7 wells at the time. The main benefit of the wells is to reduce beneficiaries' expenditures in purchasing water from tanks and to increase water availability for domestic use and for irrigation. With a revolving nature, the re-payments will allowed for the

construction of additional wells. To date, and additional 12 wells have been drilled and are operational.

The IdRC study team visited the Smakiyah Society in Karak, met the administrative board, visited some well locations and spoke with the beneficiaries.

The following summarizes the main aspects of the project:

- The grant is revolving between the beneficiaries in the Society with each family re-paying JOD 23 per month.
- The project increases water availability for beneficiaries.
- The project reduces beneficiaries' water expenditures (demand reduced from up to ten 4-m tanks per family per year to three or four 4-m tanks per family per year). The reason for such significant reduction is that some of the beneficiaries matched their loans from the CBO and built 70 meter wells, which helped significantly reduce the water expenditure.
- Enable some families to irrigate their orchards, thus, increase their incomes. Some of the wells serve olive orchards.
- Numbers of the direct beneficiaries are 19 households.
- Numbers of the indirect beneficiaries are nearly 230 persons.

3.2.8.1 *Economic Analysis*

In order to conduct the economic feasibility analyses for the project, the IdRC extracted certain water consumption and expenditure indicators from the beneficiaries during the structured interviews. Those indicators would help quantify the benefits of the project and conduct its economic feasibility analysis. Table 40 below summarizes those indicators. Table 41 summarizes the cash flow values and economic feasibility results for the project over its lifetime.

Table 40. Summary Indicators for Smakiyah Water Harvesting Reservoir Project

Parameter	Value	Comments
Initial cost	JD 3,500	
Initial number of wells	7	12 new wells have been added with revolving the grants, at a rate of nearly seven wells every two years
Annual pre-project water cost	JD 504	10-12 tanks per family annually at JD 6 per tank (this is the cost incurred by the first seven beneficiaries)
Annual post-project water cost	JD 126	3-4 tanks per family annually at JD 6 per tank (this is the cost incurred by the first seven beneficiaries)
Annual savings in water cost	JD 378	Savings for the first seven beneficiaries
Design life for the project	10+ years	

3.2.8.2 Conclusions and Recommendations

As with other rainwater-harvesting cisterns, the investment is infeasible unless supplemented by another income generating source. The NPV for this grant is also negative, and the benefit cost ratio is less than 1. This does not indicate, however, failure of the project. The project has met its objective in increasing the efficiency of water use, has reduced beneficiaries' water-related expenditures and benefited nearly 80 individuals in the first year. It is recommended that such projects be duplicated in surrounding areas, especially in locations that are not serviced with water. For instance, one of the beneficiaries added money to his grant to enable him to irrigate an olive orchard near his house, which will help improve his income from the farm.

Table 41. Summary of Feasibility Analysis for Smakiyah Society

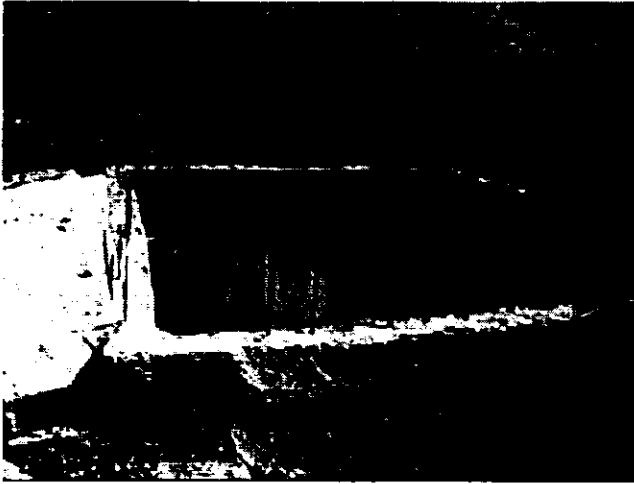
End of Year	Initial Cost	Benefits (First Batch)	Net Cash Flow
0	-3500	0	-3500
1	0	378	378
2	0	378	378
3	0	378	378
4	0	378	378
5	0	378	378
6	0	378	378
7	0	378	378
8	0	378	378
9	0	378	378
10	0	378	378
NPV			JD -900
B/C			0.72
Recovery			10+ years

3.2.9 Reservoir Construction in Eyinah Charitable Society (Karak)

The Eyinah area in Karak is one of the poorest areas in the south. The area receives its water from a nearby spring, from which the discharged water is conveyed by cement canals to the olive orchards in the area. The spring is owned by the landowners who have an agreement regarding water turns and irrigation turns. Generally, each farm receives 10 hours of water flow every 33 days. However, a farm can only absorb 5 hours worth of flow. This causes the remaining 5 hours' flow to be wasted, unless it is stored in a reservoir. Some farmers without reservoirs often trade their unused hours with a neighbor in exchange for a similar number of hours when the neighbor receives his water. This however, often causes confusion and has led to conflicts in the past. The CBO received a WEPIA grant of JD 6,000 to construct six 30 cubic meter reservoirs. To date, 4 reservoirs have been constructed and the remaining two are expected to be completed soon. The main benefits of the reservoirs are as follows

- Ability to store half of the water allocated to each farm per irrigation and the ability to irrigate once every 16 days instead of every 33 days.
- Relieve the farmers from having to purchase additional water in the summer time for supplementary irrigation (estimated at JD 180 per farm annually)

- Promoted solidarity among farmers where some farmers are cooperating and combining their reservoirs for maximum benefit



New reservoirs in Eiynah have helped farmers improve the utilization of their water rights, reducing the complications resulting from the issue of trading and selling water rights among them.

- The fund is revolving, with the farmer paying off half the grant at JD 20 monthly payments. At this rate, six new reservoirs can be added every four years.
- Every reservoir benefits at least 4 households with an average household size of 5 people.

3.2.9.1 Economic Analysis

In order to conduct the economic feasibility analyses for the project, the IdRC extracted certain water consumption and expenditure indicators from the beneficiaries during the structured interviews. Those indicators would help quantify the benefits of the project and conduct its economic feasibility analysis. Table 42 below summarizes those indicators. Table 43 summarizes the cash flow values and economic feasibility results for the project over its lifetime.

3.2.9.2 Conclusions and Recommendations

As can be seen from the financial analysis, the project is an economically feasible one, with a positive NPV, and a benefit cost ratio significantly higher than 1. In conclusion the project has met its objective in increasing the efficiency of water use, has reduced farmers expenditures and benefited nearly 70 individuals in the first year. It is recommended that such projects be duplicated in surrounding areas.

Table 42. Summary Indicators for Eiyah Reservoir Project

Parameter	Value	Comments
Initial cost	JD 6000	The amount invested in 4 reservoirs is 4000
Initial number of wells	6	Six new wells can be added every four years
Annual pre-project water cost	JD 1080	Cost of purchasing 3 hours worth of discharge at JD 60 per hour
Annual post-project water cost	N/A	
Annual savings in water cost	JD 1080	Savings for the first seven beneficiaries
Design life for the project	10+ years	

Table 43. Summary of Feasibility Analysis for Eiyah Society

End of Year	Initial Cost	Benefits (First Batch)	Benefits (Second Batch)	Benefits (Third Batch)	Net Cash Flow
0	-6000	0			-6000
1	0	1080			1080
2	0	1080			1080
3	0	1080			1080
4	0	1080			1080
5	0	1080	1080		2160
6	0	1080	1080		2160
7	0	1080	1080		2160
8	0	1080	1080		2160
9	0	1080	1080	1080	3240
10	0	1080	1080	1080	3240
NPV					JD 5000
B/C					1.9
Recovery					5.5 years

3.2.9 Water Efficiency Projects by Rural Women Cooperative Society (Balqa)

Already presented in the previous section, this CBO also received a grant from the WEPIA community grants program. One of the projects implemented under this

grant was the construction of a pool for the water delivered by the Jordan Valley Authority to be stored in, prior to use for irrigation. Before constructing the pool, the beneficiary directly applied the water delivered by the JVA to the green houses in this 23-donum farm.

The main aspects of this project are:

- The grant is revolving
- The project increases water efficiency as follows:
 - Prior to the project the beneficiary received water twice a week for 10 hours each time. This allowed the beneficiary to irrigate 5 greenhouses out of 20 each time.
 - After the project, with the ability to store water, the beneficiary can irrigate the entire farm (i.e., 20 greenhouses) with the same amount of water.
 - At a design flow of 9 liters per second the total water delivered per 10 hours is 324 cubic meters used to irrigate 5 green houses, most of which is wasted. The same amount is now used to irrigate 20 green houses (i.e., water application efficiency has quadrupled), since the pool enables the storage of nearly 400 cubic meters.



With the help of this Reservoir, Um Abdullah can irrigate 15 additional green houses using the same amount of water.

3.2.9.1 *Economic Analysis*

Tables 44 and 45 summarize the economic indicators and economic feasibility analyses for the reservoir

Table 27. Summary Indicators for Reservoir Project

Parameter	Value	Comments
Initial cost	JD 500	
Annual post-project water cost	JD 230	Water required to irrigate entire farm (4*324 = 1296 cubic meters) twice a week for 6 months
Annual post-project water cost	JD 60	Water required to irrigate entire farm (324 cubic meters) twice a week for 6 months
Annual savings in water cost	JD 170	
Design life for the project	5 years	
Maintenance	JD 40	Clearing

Table 28. Summary of Feasibility Analysis Fertilizer Pump Project

End of Year	Initial Cost	Benefits	Maintenance	Net Cash Flow
0	-500	0		-500
1	0	170	-40	130
2	0	170	-40	130
3	0	170	-40	130
4	0	170	-40	130
5	0	170	-40	130
NPV				JD 20
B/C				1.04
Recovery				5 years

3.2.9.2 *Conclusions and Recommendations*

As can be seen from the financial analysis, the project is economically feasible, with positive NPV, and a benefit cost ratios exceeding one. This project has contributed to meeting the objectives in increasing the efficiency of water use and agricultural production, and has reduced farmer's expenditures. It is recommended that such projects be duplicated in surrounding areas.

3.3 GENERAL REMARKS AND FEEDBACK ON THE PROJECTS

As can be seen in the project feasibility studies presented in the previously sections, the majority of the projects are economically sound and feasible. Although some were more feasible than others, or had a stronger impact in terms of benefits, the majority of the projects were recoverable. The projects that were found infeasible, or had a very weak economic feasibility were not so due to the failure of the project. The reason was mostly the insufficiency of the grants, which often led to the scope of the project to be reduced (e.g., some of the water main projects in the south). This had an impact on the benefits and affected the projects feasibility. The insufficiency of the grant sometimes prevented the project from becoming fully operational; thus, demonstrate any economic feasibility (e.g. water reservoir in Madaba). In other projects, the consultant believes that the grant could have been more properly allocated and the scope of the work reduced. For instance the rehabilitation of the 14 springs in Madaba without the construction of retaining walls. The consultant believes that rehabilitating a fewer springs with retaining walls would have a more sustainable impact. However, from a holistic perspective, the monitored projects were successful and had the following properties:

- ◆ Projects were mostly community based rather than individually based. Even some of the individual projects eventually reflected on a wider base through revolving grants.
- ◆ The projects decreased water related expenditures through increasing water availability, thus minimizing the need for acquiring or purchasing water by beneficiaries.
- ◆ The projects increased the incomes of beneficiaries through increasing the efficiency of water delivery, thus, improving farm yields. The increase of water availability also increased incomes through providing the beneficiaries with the ability to irrigate areas that were other wise less irrigable.
- ◆ The projects with a wide beneficiary base promoted the principles of sharing water and importance of jointly preserving this valuable resource.
- ◆ The majority of the projects are economically sound and feasible and can be easily expanded to a wider base and duplicated in other areas of Jordan.

As mentioned before, structured interviews were held with beneficiaries, some of their family members, and CBO administrators. The purpose of such interviews was to gather information regarding the attitudes towards the community grants program and an attempt to capture benefits from the beneficiaries perspective. The results of those surveys revealed the following:

- ◆ All respondents were supportive of the principle of community grants, with nearly 50% supportive of the principle of revolving the grants.
- ◆ The average number of direct beneficiaries per grant is 54.
- ◆ The average number of indirect beneficiaries per grant is 350.
- The average proportion of water conservation per grant is 45%.
- ◆ The average increase in income per grant is 27%.
- ◆ The majority of the difficulties were faced during construction.
- ◆ All beneficiaries and CBOs indicated that the size of the grant was not adequate to complete the project in the desired scope.
- ◆ Nearly 25% of the respondents indicated that the training workshops needed to focus more on the conduct of feasibility studies for proposed projects.
- ◆ The following were identified as needed future projects
 - Reservoirs and wells construction 37% of respondents,
 - Channels and pipes lining 21% of respondents,
 - Retaining walls construction 10% of respondents,
 - Green house 26% of respondents,
 - Others 6% of respondents,

3.4 SOCIOECONOMIC ASPECTS

The economic soundness and feasibility of most of the projects assessed under this study is a clear indication that the program had significant socioeconomic impacts on the beneficiary communities. This section attempts to identify the socioeconomic factors that were affected by the project and the manner in which they were affected.

CBO Credibility and Local Community Solidarity

The implementation of the projects through local CBOs helped a significant number of them in establishing and reinforcing their credibility in the local communities. During some of the field visits to the various projects and CBOs, the study team was informed that the numbers of members in some CBOs increased significantly as a result of the projects. Such trend indicates that members of local communities who had not believed in the local CBO have changed their views once on-the-ground projects were realized. The impact of such trend lies in the strengthening of the local CBOs as a result of the increased membership base. A higher membership base translates into stronger financial capability, which would help a CBO perform and finance larger numbers of projects and pursue additional grant program opportunities. The study team met beneficiaries who previously had no faith in CBOs and would not even consider visiting or meeting with members of the CBO. Once projects were operational and the benefits realized, such individuals completely changed their views.

Furthermore, the success of the revolving loans principle and the commitment of the beneficiaries is an indication of solidarity among community members and the desire to maximize the benefits of such grant programs to include the highest number of beneficiaries.

Employment, Local Business, and Local Industries

The implementation of the projects created several employment opportunities during construction and sometimes even after the completion of the project. Construction laborers were often hired from the local community. In addition, the majority of the contractors implementing the project were local contractors who purchased the construction materials from local business establishments, thus, contributing to the economy of the local community. The continuation of such programs by the Ministry of Planning would be of significant importance in the process of poverty alleviation in the rural areas.

The program had a significant positive impact on the sustainability of the agriculture sector in some governorates. Agriculture is a local industry in almost every rural area in Jordan. The benefits gained by the projects are a step towards preserving such industry in many local communities in Jordan.

Income and Reduction of Expenditures

As seen from the feasibility analyses of the various projects, a significant number of beneficiaries were able to reduce their expenditures. Although unsuccessful in obtaining income figures, the study team documented tremendous savings in expenditures related to water use in agriculture and domestic uses. The decrease in expenditure translates in an increase in income. Also, even the project that had no effect on expenditures (e.g., projects that only improved the efficiency of water deliver) had a significant impact on productivity both in terms of quantity and quality. The improvement in productivity also translates into improvements in family incomes.

Natural Resources

Due to its scarcity, the most valuable natural resource in Jordan is water. The success of the program in preserving water and increasing its efficiency of use is an important tool in combating water shortages in Jordan. The economies of rural communities in Jordan are heavily reliant on the agriculture industry. Programs assisting in the preservation of such a resource in rural areas have positive impacts on the economic standing of such communities.

Gender

As mentioned in an earlier chapter, one of the grantee selection criteria was gender. Women based organizations were given priority in grant approval. This program was an opportunity to build the capacity of women based CBOs in the management of community grants and income improvement projects. This experience will enable such CBOs to pursue additional funds and implement additional projects in the future, which will help improve the social and income standing of women in the rural areas of Jordan.

Chapter 4: CONCLUSIONS AND RECOMMENDATIONS

The main objective of this study was to monitor and evaluate a sample of the projects implemented through two community grants programs. Those were the AED/FAJVDB Ministry of Planning's EPP/CIP fund, and the WEPIA project's community grants program. The evaluation was met through documentation and quantification of improvements resulting from the implemented projects. Other objectives of the study were to study various performance indicators.

Generally speaking, the program was very successful in meeting its preset objectives. In total, 68 grants were awarded to CBOs in the eight target governorates through the FAJVDB/AED program, and 27 grants were awarded through the WEPIA community grants program in 10 governorates. This by far exceeded the original number of grants intended. Also, the majority of the grants were cost shared by the CBOs, which is indicative of the ability of Jordanian CBOs to implement projects if co-financed by donor agencies.

Another interesting issue is that a good proportion of the grants were awarded as revolving grants, which is indicative of the CBOs approach to maximizing the benefits of grants obtained from various entities. Another achievement of the project is the training that was conducted for over 200 CBOs in proposal preparation, financial management, and project supervision. Such training is believed to be an asset for such CBOs in terms of pursuing future grants and participating in future similar programs. The number of families benefiting from the program exceeded preset goal of 2000 families. The assessments clearly indicated that the projects increased the incomes of the beneficiaries. Unfortunately, the majority of the beneficiaries met during the assessments were hesitant to reveal figures on their incomes. However, reductions in expenditures were evident and significant as will be seen in the detailed assessments in the following sections.

It should be mentioned that the level of success for some projects was not as significant as others. The majority of the infeasible projects were the rainwater harvesting cistern projects. It is a known fact that those projects are economically infeasible, however, they do increase water availability and somewhat reduce expenditures. If coupled with additional income generating activities, these projects

can turn out to be very feasible, as seen in the projects implemented by Zahraa society in Karak.

Also, some CBOs received grants that should have been supplemented with additional funds from other sources. The non-pursuit of such additional funds sometimes downscaled the benefits of such projects and hindered them from realizing their full potential. It is recommended that future programs provide orientation to local CBOs on the availability of funds through governmental and non-governmental organizations, and to provide them with training to pursue such funds.

Other sources of below-expected success included in-experience. For example, some projects entailed the growing and marketing of new crops. The community grants scope did not include marketing issues. It is believed that had such CBOs solicited help from agricultural marketing entities such as the Jordan Exporters and Producers of Fruits and Vegetables or the Ministry of Agriculture, more financial benefits would have been achieved. Now that their capacity in fund management has been built, it is also recommended that the Farmers Association pursue additional funding resources to complete unfinished projects and finance new projects.

APPENDIX

RANDOM SAMPLE PROPOSED FOR FAJVDB MONITORING AND EVALUATION

Guidelines for selecting sample

- A minimum sample of 25% of the project population (exceeds 95th percentile requirements)
- Geographic distribution of sample in accordance with actual distribution of projects among governorates
- Nature of project given consideration (5 categories were identified)
- Selection purely random using the Microsoft Excel ***Random Number Generators Function***

ID	Govern.	Number Of Projects	Proportion Of Universe	Required Number	Rounded	Proportion	CBO's
1	MAAN	10	14.71%	2.5007	2	11.7%	Prince Rashed Ayl Ch.
2	TAFEELAH	8	11.76%	1.9992	2	11.7%	Dhana Soc. Karma Soc.
3	KARAK	10	14.71%	2.5007	3	17.6%	Zahra Soc. Al Fajj Soc. Jdaydeh Soc.
4	MADABA	8	11.76%	1.9992	2	11.7%	Al Aqsa Soc. Ibn Awf Soc.
5	MAFRAQ	10	14.71%	2.5007	2	11.7%	East of Mafraq Badiyah Dev.
6	BALQAA	3	4.41%	0.7497	1	5.8%	Reef Ladies Soc.
7	AJLOUN	8	11.76%	1.9992	2	11.7%	Farmers Union Fatima Zahraa
8	IRBED	11	16.18%	2.7506	3	17.6%	Tubneh Soc. Union Soc. Kufr Sum Soc.
Totals		68	100%		17	25%	